

## CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, \$2.00, additional words four cents each. Three consecutive insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

### POSITIONS AVAILABLE

EIGHT EXPERIENCED commercial refrigeration managers needed for various sections of country by Carrier Corp. as result of present commercial refrigeration expansion program. Salary and bonus. Please write, stating experience, qualifications, and references. Box 1063, Air Conditioning & Refrigeration News.

**SALES MANAGER**—To manage sales department for nationally known eastern manufacturer of refrigerated display cases, coolers, and food market equipment. Experienced in dealer contact work and estimating. Must be capable of handling a national dealer organization and field men. State salary, education, etc. Replies held confidential. Box 1065, Air Conditioning & Refrigeration News.

### POSITIONS WANTED

**AIR CONDITIONING** sales engineer seeks new connection. Wide experience in setting up and contacting distributor and dealer accounts throughout the U. S. A. Able to estimate, lay out and supervise installation of all types of air conditioning work. University graduate. Box 1060, Air Conditioning & Refrigeration News.

**SALES ENGINEER** (age 30) at present factory representative for nationally known manufacturer. Working and holding lectures with jobbers and manufacturers in the East, South, and Middle West. Has spent nine years in the industry, having had service, factory, field and sales engineering experience. Desires permanent connection. Box 1059, Air Conditioning & Refrigeration News.

### EQUIPMENT WANTED

INTERESTED IN purchasing 500 to 1,000 ½ and ¾ H.P. refrigeration motors—new or used repulsion induction or capacitor type. Also interested in purchasing single or twin cylinder late type household compressors. Any quantity. FEDERAL REFRIGERATOR CORP., 57 E. 25th St., New York City.

### EQUIPMENT FOR SALE

WE OFFER for immediate delivery Delco and Leland motors, A.C. 60 cycle, 110-220 volt, ¼ H.P. capacitor type \$5.00; ½ H.P. \$5.75; ¾ H.P. \$7.50; 1 H.P. \$17.25; ¾ H.P. \$18.50. These are all brand new motors in original cartons. Stock on hand of other cycles and D.C. motors. INTERSTATE REFRIGERATOR CORP., 96 Fifth Ave., New York City.

### REPAIR SERVICE

DOMESTIC CONTROLS repaired: Ranco pencil \$1.75, Ranco box \$2.00, General Electric \$2.00, Tag \$2.00, Cutler-Hammer \$2.00, Penn \$2.00, Bishop Babcock \$2.50, Majestic \$2.50, Penn magnetic \$2.50, G. E. Frigidaire \$2.50. In business over 20 years. Our name is our guarantee. UNITED SPEEDOMETER REPAIR CO., INC., 436 West 57th Street, New York City.

**CONTROL REPAIR** service. Your controls repaired by expert mechanics, with special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. HALELECTRIC LABORATORY, 1793 Lakeview Road, Cleveland, Ohio.

**MAJESTIC UNIT** Replacements—The only original direct factory Majestic replacements. Guaranteed 18 months in writing. All models \$30.00. Immediate delivery from our stock of 2,000 units. Also G. E. and Westinghouse rebuilding guaranteed 18 months from \$30.00 up. Largest rebuilders of Hermetics in the world. G & G GENUINE MAJESTIC REFRIGERATOR AND RADIO PARTS SERVICE, 5801 Dickens, Chicago.

### MISCELLANEOUS

**REVOLUTIONARY ELECTRIC** Range Burner with a new sales story for domestic and heavy duty heating appliances ends service problems; housewife replaces burnouts herself. Higher wattages, lower element temperatures. Longest life. Open or closed designs optional. Patent pending. Write Electrical Engineer, Box 1064, Air Conditioning & Refrigeration News.

### PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

## New Sales Director



T. E. HOYE  
Sales manager of the ice cream cabinet division of Savage Arms Corp.

## Many Cities Report Gain In Business Following 'Salesmen's Crusade'

(Concluded from Page 1, Column 3) ciation, Akron District Auto Dealers Association, Akron Real Estate Board, Akron Gasoline Retailers' Association, Akron Builders' Exchange, and the Akron Retail Grocers' & Meat Dealers' Association.

In Detroit, Gar Wood Industries, Inc. has adapted the crusade idea to its own organization's sales activities, and is offering special weekly bonuses to its salesmen.

Many organizations in Springfield, Ohio—women's clubs, church societies, civic, patriotic, and fraternal organizations, agricultural groups, retailers, and labor organizations—are lending support to the movement. Mayor Walter K. Welmer is chairman of the "Sales Mean Jobs" campaign.

So thoroughly is the city being canvassed that a committee has issued a sign for use in the front door of homes in which there is illness. "Illness—Crusaders will please not disturb the occupants of this house," the sign reads.

On the theory that what lifts up the economic side of life has a beneficial effect upon the spiritual, a number of Springfield's pastors one Sunday recently called attention to the crusade from their pulpits, urged their flocks to give their moral support to this movement toward better times.

In St. Joseph, Mo. the Central Labor Union, headed by Mace W. Brown, has joined the crusade along with other business interests of the city.

General increase in business in Charlotte, N. C. since the campaign was inaugurated there has averaged 15%, based on reports to the chamber of commerce, reports P. H. Batte, advertising director of the Charlotte Observer. The newspaper's direct shows a 5½% increase as a direct result of the drive, Mr. Batte says.

"I consider that the Salesmen's Crusade has not only been successful from the standpoint of producing more business, but it has had a most wholesome effect on improving the morale of our citizens," Mr. Batte writes.

One thousand merchants, manufacturers, and salesmen attended the mass meeting at which the crusade was launched in Wabash, Ind., reports Joe H. Nixon, president of the Wabash Plain Dealer. The meeting was planned as a surprise to the business men in general, only the executive committee of the Wabash Retail Merchants Association having been "in on" details of the event.

Speakers included a county judge, a leading manufacturer, a newspaper publisher, and a Nash-Kelvinator

representative. The retailers' association financed the meeting.

Original sponsor of the campaign in Wabash, the Plain Dealer and other Nixon newspapers are paying for an advertisement in Editor & Publisher, calling the crusade to other newspapers' attention, Mr. Nixon says.

Efforts of several Des Moines, Iowa, businesses in connection with the campaign enabled them to show sizeable percentage gains in June over the same month of 1937, reports Forrest R. Geneva, advertising manager of the Des Moines Register-Tribune.

"The idea has stimulated sales organizations," says Mr. Geneva, "and has served to give the public a little better idea of the part it plays in keeping the wheels of business rolling along."

One hundred and sixty-two firms were represented at the meeting launching the crusade in Atlantic City, N. J., reports Monroe L. Mendelson of the Atlantic City Press-Union. All solicitors for the paper are making five extra calls per day.

Robert E. Peifer, advertising manager of the same newspaper, reports that more than 50 new contracts were secured as a direct result of the publication's participation in the crusade.

A survey completed July 1 by the New Orleans Association of Commerce reveals that the week's business following inauguration of the sales drive showed a marked increase over both the preceding week and the same week of the previous year, reports Aubrey F. Murray, advertising director of the Times-Picayune.

"Comments from people in all

walks and stations of life indicate this 'Sales Mean Jobs' idea is the most universally accepted idea that has ever been offered in Milwaukee," writes Roger H. Ferger, assistant publisher of the Milwaukee Sentinel. The newspaper plans to promote the campaign aggressively throughout the month of July.

## New Design Features Claimed For 'Chicago' Compressor Seals

(Concluded from Page 1, Column 3) that the seal will operate as well on jobs of this kind as on undamaged shafts.

Mr. Karlberg also claims that a triple protection, leakproof feature is assured because of the nature of the construction of the seal at both front and rear of the compressor shaft in addition to the spring and bellows. Another feature of the new seal unit is the secondary seal in the flange. All "Chicago" seals have compensating, precision-built friction rings which fit against the shaft in order to lock the seal securely into place.

A special "Chicago" replacement seal, with slotted shaft, has been developed for Norge units, and, according to Mr. Karlberg, has been tested in numerous rebuilt units.

According to Mr. Karlberg, original patent application on the "Chicago" seals was made in 1936.

The new line of seals will be sold to service engineers through refrigeration parts and supplies jobbers.

## Dealers Organize When Utility Quits Selling

(Concluded from Page 1, Column 4) operative program with the utility, without a drop in total sales volume in the district, officials explained.

Dealers taking part included:

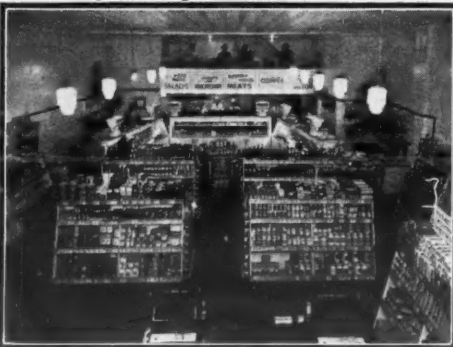
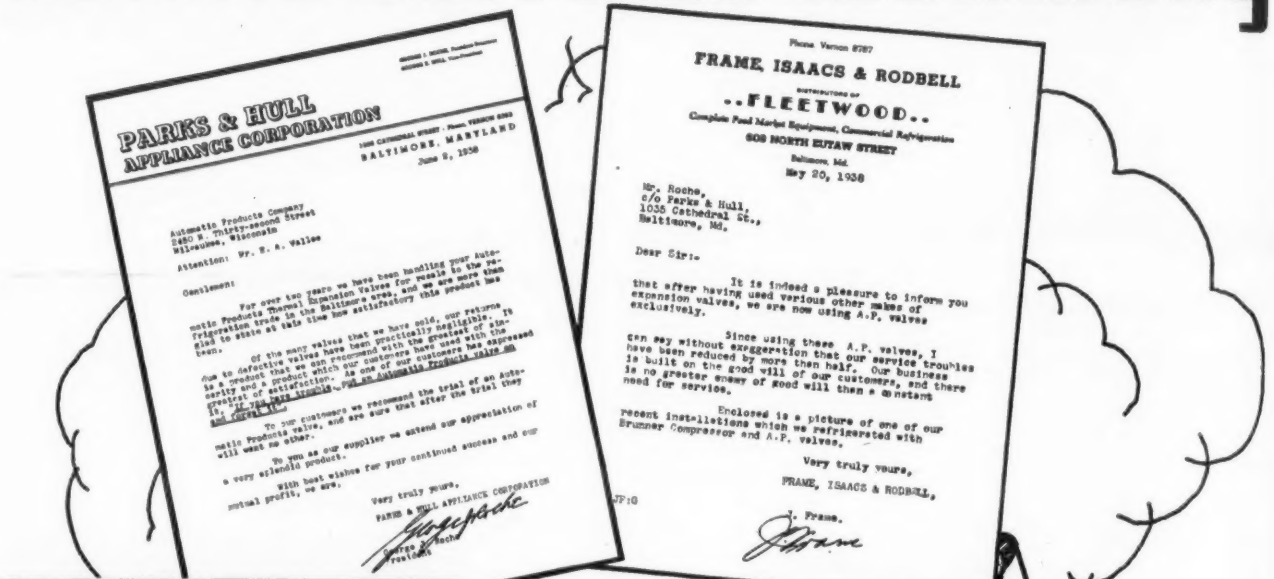
H. L. Stiff, H. L. Stiff Furniture Co.; J. O. Simmons and R. B. Sears, C. S. Hamilton Furniture Co.; L. W. Jones, Good Housekeeping, Inc.; Norris Ames and R. G. Allen, Ames Hardware & Furniture Co.; Gordon T. Van Cleave, Silverton Electric Co.; Chas. Perrott, Allen Hardware Co.; Cyril Nadon, Nelson Bros.; A. C. Rowe and L. R. Bartholomew, Montgomery Ward & Co.; James McMullan, Sears, Roebuck & Co.; F. J. Chapman and J. R. Humphrey, Imperial Furniture Co.; and W. H. Rush, Rush & Yeater Co.

## Pacific Conditionaire Co. Assets To Be Auctioned

CHICAGO—Public auction of the assets of Pacific Conditionaire Mfg. Co., Inc., former builder of portable air-conditioning units for homes, offices, and hotel rooms, will be held at 11 a.m. Friday, July 15, at the company's offices at 4223-45 W. Lake.

Offered for sale in the auction will be complete portable air-conditioning units, raw materials, motors, machinery and equipment, office furniture, jigs, dies, patents, patents pending, customers' lists, and the right to use the name "successors to."

# Double-Barreled Testimony



## DEPENDABLE The Byword for A-P Valves

- Installation — Scherr's Food Market, Baltimore, Md.
- Cabinets — Fleetwood
- Refrigeration Unit — Brunner Mfg. Co.
- Installed by — Frame, Isaacs & Rodbell, Baltimore, Md.
- Valves —
- Purchased through — Parks & Hull Appliance Corp., Baltimore, Md.

When Installing Engineers, Service Engineers, and Refrigeration Jobbers all vouch for A-P Valve efficiency, that's Reputation well-earned. But when Valve USERS add "If you have trouble, put on an A-P Valve and forget it"—here is more proof than any "doubting Thomas" would dare quibble about.

The enthusiastic testimony of the refrigeration industry's leaders surely is sufficient evidence that A-P Valves really have something. If you have not already proved this in your own experience, we'll welcome the opportunity to give you more information.

**AUTOMATIC PRODUCTS COMPANY**  
2450 NORTH THIRTY-SECOND STREET  
MILWAUKEE WISCONSIN

• REFRIGERATION PARTS JOBBERS, WHO RECOGNIZE QUALITY, STOCK

**DEPENDABLE**

THE BYWORD FOR A-P VALVES



## EVERYTHING PROGRESSIVE ENGINEERS HAVE DEVELOPED FOR REFRIGERATION

**GENERAL REFRIGERATION CORPORATION**  
Dept. F-3, Beloit, Wisconsin, U.S.A.



# Air Conditioning & Refrigeration News

The Newspaper of the Industry

Trade Mark Registered U. S. Patent Office. Established 1926 as Electric Refrigeration News  
Member Audit Bureau of Circulations. Member Associated Business Papers.

Written to Be Read on Arrival

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TWENTY CENTS PER COPY

## THE COLD CANVASS

By B. T. Umore

### Life At Its Darkest

Some of the lads were trading anecdotes on Convention Life the other evening when the talk turned to Embarrassing Moments. Apparently the lot of the convention orator is not all beer and vittles.

There was, for example, the time a factory man was demonstrating the glories of new models before a dealer convention in New York. The summa cum laude achievement of the engineering staff had been an ice tray which ejected the cubes mechanically.

There was no opportunity to hook up any of the refrigerators displayed on the platform, so one of the boys took a couple of trays to the hotel, asked them to freeze the cubes, then inserted the trays back into a display model just before the meeting started.

Came time to demonstrate. The orator went to the refrigerator, pulled out a tray, noted that all seemed well, and returned to face his audience. Dramatically he turned the tray upside down and pulled the ejector lever.

There was a big splash, and water gushed out all over the floor. It seems that the hotel refrigerator had merely frozen a thin layer of ice on top of the cube compartments!

After that, of course, the delegates were well out of hand.

### More Red Faces

Many a tale was told of easy-opening doors which never would open in the clutch—or, once opened, wouldn't close. They might work 100 times out of 100 before the meeting, but they wouldn't perform before an audience.

And then there was the song leader who stood up to direct a convention in singing one of those omnipresent parodies. This one started out:

"Let's all sing like the (brand name) sings: hum, hum, hum. . ."

The conventioners were ready for that one. In concert, to the amazed consternation of the leader, they shouted:

"Let's all sing like the (brand name) sings: squeak, squeak, squeak, squeak, squeak."

Payoff yarn was the one concerning the convention spellbinder who perorated:

"Why, I can't begin to count the number of things our company has done to make your business successful."

Came a sardonic voice from the audience:

"Na-a-ame one."

This column hereby declares itself open to contributions on other Embarrassing Moments—in or out of conventions—experienced by readers. What was it that made your face red that time?

(Concluded on Page 5, Column 1)

## San Antonio Dealer Group Elects Officers

SAN ANTONIO, Tex. — Royal P. James, merchandising manager, Stowers Furniture Co., was elected president of the San Antonio Radio & Refrigeration Trades Association at the annual election of officers held here last week.

E. R. Moon, manager of the refrigeration and major household appliance departments of Joske Bros. Co., was elected vice president.

Directors were named as follows: George S. Jeffers, Westinghouse Electric & Manufacturing Co.; D. Berryhill, Peaslee-Gaulbert; W. T. (Concluded on Page 5, Column 5)

## Air-Cooling Boom In Oklahoma City Shown In Survey

OKLAHOMA CITY, Okla.—Excessive summer temperatures, ranging from 105 to 120° F., have been largely responsible for a boom in air-conditioning business during the last two years which has brought the Oklahoma City territory's total to 370 installations aggregating 3,804 tons of equipment, according to a survey recently completed by Oklahoma Publishing Co., publisher of the Daily Oklahoman and Times newspapers.

The Oklahoma City trading area includes 26 counties with a population of 243,294 families and 47% of the state's taxable income.

Installations made prior to 1934 totaled 625.7 tons. In 1934, equipment totaling 219.6 tons was installed, and another 330 tons were added in 1935.

It was in 1936, however, that volume air-conditioning sales began, with a total installed tonnage of 1,029.6. The following year, 1937, saw 1,599.1 tons installed. For both of the last two years, the total of installed tonnage exceeded the entire total of (Concluded on Page 20, Column 3)

## 6-Week's Drive Boosts Iowa City Sales 37% Over 1937 Record

IOWA CITY, Iowa—An increase of 37% in sales of household electric refrigerators over the corresponding period of last year resulted from a six-weeks' campaign recently staged by the Radio & Refrigeration League of Iowa City, reports George M. Sheets, league secretary.

A total of 108 electric refrigerators were sold in the campaign, compared with 79 during the same period of last year. Modeled along lines of the test drives staged last fall in Oklahoma City and Dallas, the campaign made extensive use of Modern Kitchen Bureau materials.

Weekly newspaper advertisements, stressing the theme "In Every Home With Electric Light, There Should Be Electric Cold," were used and 12 billboards repeated the catch-phrase on main traffic arteries throughout (Concluded on Page 20, Column 1)

## Bureau Plans Fall Drive on Ranges, Water Heaters

NEW YORK CITY—Right into the kitchen will go Modern Kitchen Bureau's fall campaign on electric ranges, in an effort to prove to housewives during a "Discovery Month" that "electric cooking costs one-half what you think."

October will be the "Discovery Month," during which electric range salesmen, with the aid of Kitchen Bureau materials, will help non-user housewives discover that electric cooking costs are on a competitive basis with those of any other method they can name.

The retail salesman is key man in the fall electric range drive, details of which will be broadcast to dealers early in August. Year-end campaign is designed as a clean-up drive, to capitalize on the interest in electric cookery aroused by the bureau's spring sales and promotional work.

Main sales-invoking idea in the fall electric range program calls for salesmen to visit homes where electric ranges are in operation, get the actual bills which show cooking economy, and use these "unanswerable" arguments to clinch more sales.

Complete program for the campaign (Concluded on Page 20, Column 2)

## Water Heater Salesmen To Get Special Help

NEW YORK CITY—A fall program designed to provide additional ammunition for the retail electric water heater salesman has been developed by the National Electric Water Heating Council, reports A. H. Jaeger, chairman of the advertising committee of the water heater section of National Electrical Manufacturers Association.

Capitalizing on the fact that more than a million electric water heaters are now in use, the council has set aside the month of October as "Discovery Month," inviting prospects everywhere to discover for themselves "what a million users of electric water heaters have discovered."

To help salesmen make additional (Concluded on Page 20, Column 2)

## Carrier Introduces Self-Contained Central Systems Up To 10 Tons

### Stream of Air Cools Beverages In New Type Koch Cooler

NORTH KANSAS CITY, Mo.—A new type of bottled beverage cooler which utilizes a rapidly circulating stream of air instead of water bath or brine is being marketed by Koch Refrigerators here under the trade name "ZeroStream."

In the new cooler, it is said, bottled beverages can be cooled to temperatures colder than the freezing point of water. Drinks thus cooled, claim Koch engineers, taste better and have more thirst quenching ability than when served under ordinary conditions.

Cooling below 32° is not possible in a wet cooler, since the water freezes at that point. Because they (Concluded on Page 8, Column 4)

## First Federal Grant For Locker Plant Is Made To Piqua, Ohio Co-op

DAYTON, Ohio — A community "ice box," for the storage of food supplies, is to be erected near Piqua by the Pioneer Rural Electric Cooperative Co., Inc., following the allotment of \$15,000 for this purpose by the Rural Electrification at Washington. It is the first project of its kind in the United States and REA officials will watch its progress with a view toward the possibility of encouraging similar projects elsewhere.

Those living within reach of the electric refrigeration plant will be able to rent lockers in which they may store a year's supply of meats and other foods, or keep perishable foods while waiting marketing.

Although cooperative refrigeration plants have been established in various parts of the country, this will be the first time the Federal government has stepped in and furnished (Concluded on Page 5, Column 4)

### Announce Other Product And Distributing Plans At Summer Conclave

SYRACUSE, N. Y.—Introduction of self-contained "central-station" cooling systems in 5 and 10-ton capacities, and announcement of some new distributing policies, marked the meeting of approximately 300 Carrier dealers and distributors from all parts of the country here last week.

Tendency of concerns engaged in the manufacture of air-conditioning equipment to supply "package" merchandise was demonstrated by the announcement of the new central-station units. These new conditioners require no refrigerant connections on the job, and may be placed in service with simple water, electric, and duct connections.

The Carrier 5-ton central-station unit has a V-type Freon compressor, driven by a 5-hp. motor mounted on the same base, while the 10-ton unit has two V-type Freon compressors and two 5-hp. motors serving a common condenser. Purpose of the duplex arrangement is to permit the compressor to operate at 50% of capacity without change in motor speed. Units are complete with coils, fans, control valves, and all accessories.

The two-day meeting was in charge of William Price, sales manager of Carrier Corp., and delegates were welcomed to Syracuse by Willis H. Carrier, board chairman of the company. Headquarters were at the Syracuse hotel.

According to an announcement by Mr. Price, certain Carrier industrial (Concluded on Page 5, Column 2)

## Jack Schaefer Directs ACMA Press Bureau

WASHINGTON, D. C.—John T. Schaefer, at one time engineering editor of AIR CONDITIONING & REFRIGERATION NEWS, has been appointed director of a Bureau of Information on Air Conditioning, which has been formed under the sponsorship of the Air Conditioning Manufacturers' Association, according to announcement made last week by William B. Henderson, executive vice president of the association.

The bureau will serve as a clearing house for feature writers and (Concluded on Page 2, Column 3)

## Gibson Plans Range Line For This Fall

GREENVILLE, Mich. — Gibson Electric Refrigerator Corp. has entered the electric range field with the announcement of a complete line of ranges to be introduced in the fall, according to Charles J. Gibson, president.

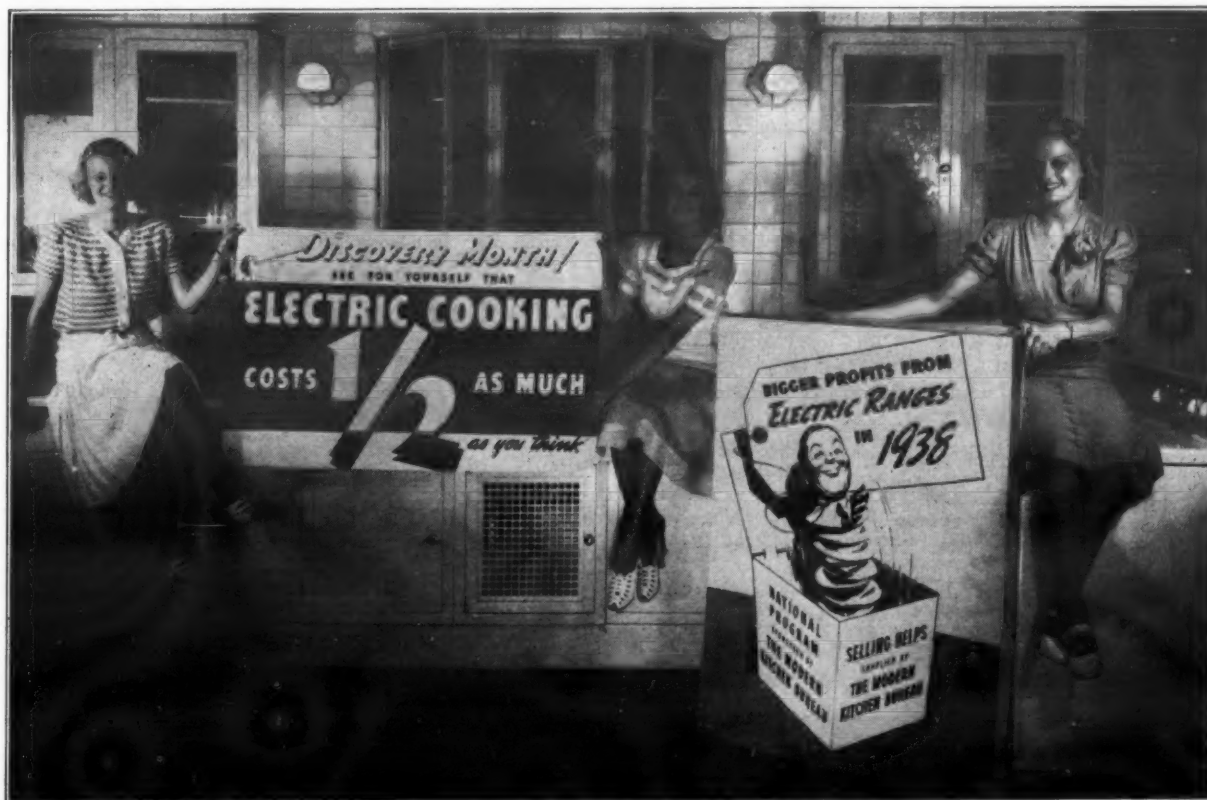
A new range division has been established under the direction of E. A. Rutenber, former special range research man for Norge division, Borg-Warner Corp.

In making the announcement, Mr. Gibson explained that the move has been made to even up production schedules at the factory and to meet distributor and dealer requests.

Mr. Rutenber has had considerable experience in the electric range industry, and is recognized as the developer of a number of features, including full current oven thermostat, automatic oven timer, cooking units, and control circuits.

In 1912, he formed the Rutenber Electric Co., and later he joined Lindemann & Hoverson of Milwaukee, remaining with this firm for 15 years.

## Planning To Make 'Discoverers' of Range Prospects



Smiles like these will wreathe homemakers' faces everywhere, believes Modern Kitchen Bureau, when they realize that electric cooking costs are on a par with any other method. The bureau's fall promotion program, with October as "Discovery Month," aims at building housewives' buying urge by going right into the kitchen with proof that "electric cooking costs one half as much as you think."



## Specialty Selling Methods

### Merchandise Mart To Offer Kitchen Course

CHICAGO—To train selected students in "kitchen engineering," the school of merchandising of the home service bureau in the Merchandise Mart here will be opened soon, Miss Florence J. Sterling, supervisor, has announced.

Under the educational plan, 35 college and high school graduates will be selected each month and trained under a 60-day practical course to design complete kitchens, laundry and basement ensembles, and other household furnishing combinations.

The students will be given practical experience in the metropolitan territory, and under the direction of architects and construction superintendents will be taught essential details of building and remodeling.

Upon graduation from the special course, Miss Sterling said, the trained "kitchen engineers" will be employed by retail merchants, more than 100 requests already having been received for graduates.

To be eligible for the course, the applicant students must have some training and experience in drafting and must meet requirements of the school, Miss Sterling pointed out.

James R. Ozanne, merchandising counselor, will assist Miss Sterling in conducting the school.

### Fred Rackliffe's Kitchen Saves Him Many a Dinner Check

NEW BRITAIN, Conn.—Model electric kitchen installed in its second-floor display rooms serves a double purpose for Rackliffe Bros. Co., Kelvinator distributor in this territory.

The company frequently calls in small groups of dealers for meetings, and formerly provided luncheon at nearby hotels for those who attended. When the demonstration electric kitchen was installed, space for tables was provided in the room.

Now, when dealers are present for meetings, the Rackliffe home economist prepares and serves meals from the kitchen. So dealers are able to see the kitchen in operation, as well as remain on the premises all through the meeting.

Fred Rackliffe, head of the company's appliance operation, estimates that the kitchen saves him about \$1,000 a year in luncheon and dinner bills for dealers, besides avoiding the distractions of the lunch hour.

Open for display purposes at all times, the kitchen has been of particular help in bringing home to dealers the close relationship between the company's appliance and cabinet departments, Mr. Rackliffe says.

### Display Setup Previews Units 'As Installed'

LOS ANGELES—A three-division model kitchen, showing refrigerators of three different sizes in relation to the space they occupy, is proving a valuable sales asset in the refrigeration department of J. W. Robinson Co., local department store.

Center of the set-up is occupied by a 9 x 12-foot complete kitchen, in which the cabinets, refrigerator, and other appliances are shown in normal position in a roomy kitchen. At either end of this large "room" are small 6 x 8-foot spaces, in which sink and cabinets are compressed into small space to make room for a smaller model refrigerator.

Selling is simplified by this arrangement, the salesmen first finding out the approximate size of the prospect's kitchen, and then leading her to the proper part of the display.

### Schaefer Heads ACMA Information Bureau

(Concluded from Page 1, Column 5) editors seeking information on air conditioning, Mr. Henderson said. Offices will be maintained at the association's headquarters in the Southern building here.

Mr. Schaefer left a position as associate editor of Industrial Selling to head up this activity. Prior to that he had been with York as director of publicity. From 1931 until 1935 Mr. Schaefer had been engineering editor of AIR CONDITIONING & REFRIGERATION NEWS.

### Hale Bros. Store Finds Success In Branches

SAN FRANCISCO—Operating two branch stores in San Francisco and several others in nearby towns has increased sales of household appliances in the last few years for Hale Bros., local department store, according to a report by the appliance sales department.

Particularly effective in creating additional sales are the two branch stores in the city, each situated in a thickly populated shopping area.

In these locations, the stores draw a large volume of business from working people who have little time to shop downtown, it is stated.

The branch stores remain open nights, so that both husband and wife may inspect the appliance at leisure. Even if the husband does not have time to change his working clothes, it is said, he feels perfectly at home in the neighborhood appliance store.

Another advantage in operating branch appliance store, Hale Bros. states, is that they are excellent outlets for trade-in merchandise. Used stock is kept off the floor of the main downtown store, and is displayed in the branch stores, where it moves more readily.

### G-E Kitchen Book Gives Layout, Wiring Data

CLEVELAND—A new kitchen planning book, containing recommendations based upon findings of kitchen specialists (including architects, home economists, and housewives) who have been closely associated with the modern kitchen movement since its inception, has been announced by the specialty appliance sales division of General Electric Co.

This book, which will be made available through G-E distributors, tells the importance of an efficient kitchen, gives basic kitchen layouts, tells how to determine kitchen size and select kitchen equipment, explains wiring, and gives appliance specifications.

### After 3 Sales, He Was Really Ready To Celebrate!

DECATUR, Ga.—Going on a picnic of just loafing may be a pleasant way to spend July 4—but there's not much profit in it.

Avis McCorvey, Decatur salesman for Georgia Power Co., wanted to have profit, as well as fun—so before he got around to celebrating, he sold three refrigerators totaling \$476.

### Bert Kaple To Represent Copeland In South



BERT KAPLE

ATLANTA—Appointment of Bert Kaple of Bert Kaple Co. as southern representative for Copeland Refrigeration Corp. has been announced by Frank J. Gleason, Copeland's vice president in charge of sales.

Mr. Kaple, who just recently completed a contract with Warren Refrigerator Co. (of Atlanta and Beaumont, Tex.) which now is employing Copeland condensing units exclusively with its products, is maintaining a complete stock of all Copeland condensing unit equipment here.

For 23 years prior to his connection with the Copeland organization, Mr. Kaple had been with Brunner Mfg. Co.

Starting out in the factory, he later was transferred to the company's Cincinnati office. Then he became Brunner representative in practically all territory of the United States and Canada, the southwestern states being the one exception. From 1920 to 1925 he had charge of the company's Pacific coast territory, being transferred to Atlanta in 1926.

### Satisfied User Buys 5 New Refrigerators For Sons

MACON, Ga.—Refrigerator Dealer L. N. Jordan has further proof that keeping customers satisfied pays off definite dividends in sales.

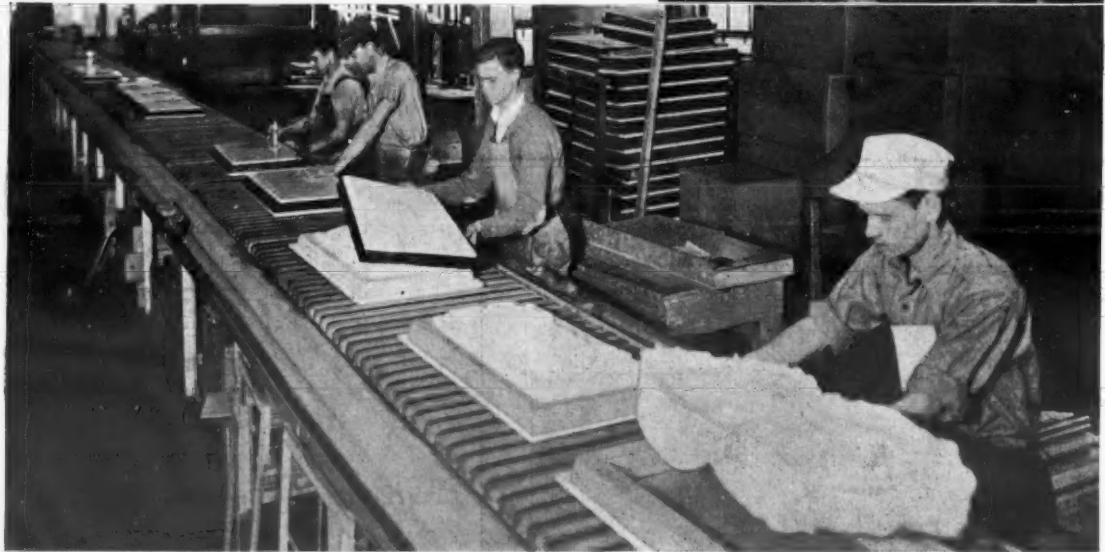
About a year ago, Mr. Jordan sold a Frigidaire refrigerator to C. T. Sanders at Lizella, Ga., a town near Macon. A few weeks ago, Mr. Sanders walked into Jordan's and ordered five more refrigerators—one for each of his sons. And he paid cash.

## THIS TWOFOLD SERVICE HELPS BUILD BETTER REFRIGERATORS

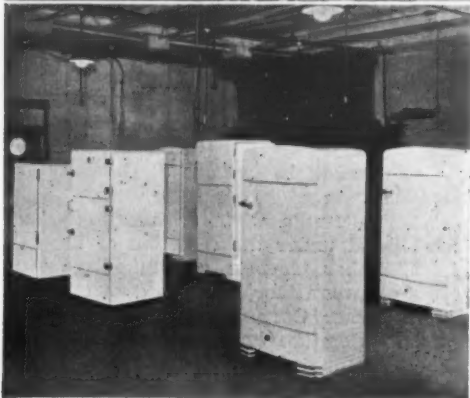
Armstrong offers manufacturers efficient insulating materials, plus all the facilities of the Armstrong Life Test Room



ON THE ASSEMBLY LINE, Armstrong-Corning Wool Insulation is easily put in place. In the form of plain bats, fold bats, veneer bats, it fits accurately and fills the available space.



CABINET DOORS being insulated with Armstrong-Corning Wool in the plant of the Cavalier Corporation, in Chattanooga, Tennessee. Here plain fold bats are being used.



MODELS receive a thorough testing in this temperature- and humidity-controlled Armstrong's Life Test Room prior to being put on the market. It is possible in a few months to approximate a lifetime of normal service. Performance of the refrigerators can be accurately gauged.

USE both these services for better designed, more efficient domestic refrigerators: First, choose efficient Armstrong insulating materials—Armstrong's Temlok, and Armstrong-Corning Wool Insulation. Second, let the Armstrong Life Test Room check on the efficiency of your cabinet!

Armstrong's Insulation adds to the efficiency of any refrigerator. Temlok provides structural strength and saves space. Armstrong-Corning Wool, the new-type, fibrous glass insulation is highly efficient, naturally resilient, and won't deteriorate.

Test your new models in the Armstrong Life Test Room under controlled conditions. Here temperature and humidity more severe than would be found in the tropics are maintained. Under these conditions it is possible in a few months to approximate the use a cabinet would receive in a lifetime of kitchen service.

For complete information about either Armstrong's Insulation materials or the Armstrong Life Test Room, write today to Armstrong Cork Products Company, Building Materials Division, 1002 Concord St., Lancaster, Pa.



## Armstrong's EQUIPMENT INSULATION

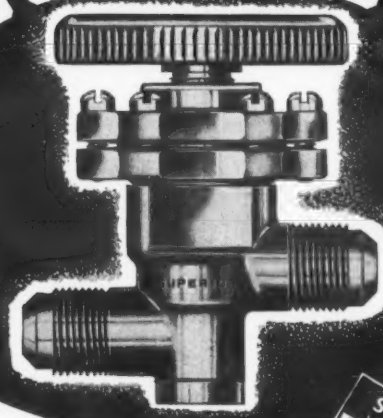
LK CORKBOARD ~ TEMLOK INSULATION ~ ARMSTRONG-CORNING WOOL INSULATION

A New Diaphragm Packless Valve

# SUPERIOR

by Name

in Quality



A FORBES PRODUCT

### CHECK THESE Superior FEATURES

Multi-dissimilar-metal Diaphragm; larger than previously used in valves of this type; forms a positive metal-to-metal seal, and provides definite assurance against leaks.

Pressure cups—effective in ANY position—isolate pressure from Diaphragm Chamber; assuring longer Diaphragm life.

Bolted bonnet; readily removable for Diaphragm inspection or replacement—with the refrigerant vapor or liquid pressure in the refrigeration system and in the valve.

Entire internal assembly easily removed, to preclude any possibility of damage to valve parts when soldering refrigerant lines to valve connections.

Advanced design of valve seat assures easy "finger-tight" closing. Unrestricted flow area equal to, or in excess of line sizes.

Be sure to get your copy of BULLETIN R2



SUPERIOR VALVE & FITTINGS COMPANY  
500 THIRTY-SEVENTH STREET • PITTSBURGH, PA.



# KOCH

# ANNOUNCES

*a new, sensational  
and revolutionary*

# HEAVY DUTY *Dry* BEVERAGE COOLER

**SUPER-QUICK  
CHILLING**

**BOTTLE LABELS  
DRY—NOT SOAKED**

**PROVED BY ACTUAL TEST**

**LOWEST OPERATING COST**

**SANITARY**

Cools bottled beverages as quickly or more quickly than a wet cooler, and gets them colder. Chills colder than 32°.

The performance of this new product is startling and unbelievable. Nothing else like it.

**INTERESTED DISTRIBUTORS**

WRITE, PHONE, OR WIRE KOCH TODAY concerning the franchise for this unique product. It's the most sensational refrigeration product you can sell. Possibilities for profits are unlimited. Act quickly.

# KOCH REFRIGERATORS

**NORTH KANSAS CITY, MISSOURI**



## Profitable Sales Ideas

### Winning Water Heater Salesmen Stress Cleanliness, Economy, Safety

NEW YORK CITY—Utility company water heater salesmen from two eastern states and one northwestern state won \$10 cash awards for the best letters on "How I Sell Electric Water Heaters" in the May section of the contest being sponsored this year by the National Electric Water Heating Council of Modern Kitchen Bureau.

May winners were: W. K. Powers, Northern States Power Co., Minneapolis; J. P. Morrison, Pennsylvania Power & Light Co., Holland, Pa.; and L. F. Meeker, Niagara, Lockport & Ontario Power Co., Camden, N. Y.

"In my territory, which is located in Lancaster County, Pa., the water heater prospect is in a great majority of cases a rural customer, without a curb-to-cellar water service," writes Mr. Morrison. "The prospect depends on a deep or shallow well system, or the familiar water cistern, the water of which is put under pressure.

"The fact that there is a very definite limitation, imposed by nature, on the quantity of water available, gives me a wonderful opening.

"I have sold few women electric water heaters, although they are a

great assistance in selling the need for an adequate hot water service. I would much prefer talking 'water heater' to Farmer Jones down in his cellar, where I can show him how he can install an automatic hot water service at reasonable cost, and at the same time add to the reserve of his cold water supply.

"I do this by explaining that, since the electric water heater does not require a flue connection, it can be installed right under or relatively close to the kitchen sink, instead of near the furnace flue, where competitive water heating devices are installed. This eliminates the excessive waste of water due to draw-offs through large diameter and long pipe runs, which are necessary under present setup to obtain small quantities of hot water at intervals for kitchen use. . . .

"I describe the proposed temperature and pressure relief valve installation, which he does not have on his present system. I sell Farmer Jones on 150-160° sufficiently warm water, instead of the 'maybe' cold water of the 'maybe' hot 200° water in his present system.

"I emphasize the fact that water heated electrically up to 150° does

not have a 'breakdown action on tanks and plumbing lines."

"When making a call on any new electric water heater prospect, a salesman must realize that the prospect, in most cases, will already be in possession of some kind of water heating equipment," Mr. Meeker says.

"The first step which I take is to try, tactfully, to make the prospect dissatisfied with his present method of water heating. This, I accomplish by carefully outlining four important advantages of the electric water heater, without definite reference to any other type of competitive fuel.

"The four resultant advantages of electric water heating which I employ are cleanliness, safety, convenience, and economy.

"The cleanliness feature, I illustrate by reminding the customer that an electric water heater gives off no sooty film caused by combustion, explaining that the heating units are completely immersed in water. . . .

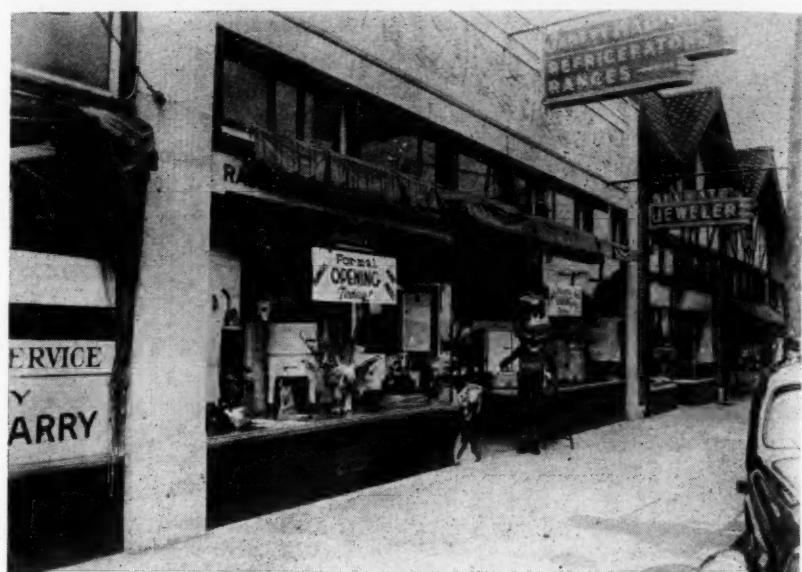
"I also point out that the attractive exterior may be easily maintained by simply wiping a storage heater, restoring the original eye-appeal and making the heater an attractive piece of furniture.

"The safety feature of electric water heating should be very tactfully presented without causing the customer to believe that I am attempting to instill fear of using competitive equipment.

"I begin the explanation of this feature by pointing out the fact that the units being immersed eliminates all fire hazard. In connection with this I also point out that an electric water heater is the only water heater made which eliminates all fire hazard.

"The automatic thermostats, which I explain as to accuracy, together

### Veteran Hotpoint Dealer Expands



Jarett Radio & Refrigerator Co. of Louisville, Ky. just recently took a good lusty kick at the recession by opening a new and very modern store which has five times as much floor space as the quarters formerly occupied by the dealership. David Jarett, one of the real veterans of appliance

selling in Louisville, is owner.

Top picture shows the store exterior at the time of the formal opening, with the familiar "Hotpoint man" ready to welcome guests. (Center) The compact all-electric kitchen demonstration unit. (Bottom) General view of the showroom floor.

with the installation of a temperature and pressure relief valve, is my conclusive proof of safety.

"The third advantage, convenience, is one which I elaborate upon to the utmost.

"The use of electricity for water heating eliminates the emptying of ashes, shoveling of coal, chopping of wood, or the carrying of oil. The only necessary operation is the opening of a faucet, thus giving more leisure time to everyone involved.

"I find it advisable to also mention the rapid recovery of the electric water heater as a factor to convenience, as the water will become reheated, in most cases, as fast as it can be utilized for cleaning or bathroom purposes.

"The final discussion which I present is that of economy. Certainly this factor is one which cannot be overlooked and one which must be most intelligently presented, as mistakes in estimating very often result in poor customer relationships with a consequent 'mill-stone about the neck' of future sales.

"I have been quite successful in making the prospect understand that the efficient insulation in the heater, together with the location of the heater in the building, and the installation of a tempering tank, are important factors in the economical operation of electric water heater. . . .

"I base my estimates of cost on the realization that one kilowatt hour of electricity raises four gallons of water 100°. This I know to be correct by several actual meter tests.

"After adding 10% to the estimated use of water for each person in the family, I formulate a monthly consumption estimate in dollars and cents. By adding this 10%, I find that I am invariably high when the

customer gets his bill, thus creating a confidence among future prospects for electric water heaters.

"The presentation of the facts herein mentioned is made as a follow-up to direct mail which I send out at two-week intervals, making the customer conscious of a need before I arrive.

"Realizing that the 'proof of the pudding is in the eating,' as a parting gesture of my first call, I refer the prospect to several users of electric water heaters in the vicinity, to bear out conclusively the statements I have made.

"Mine may not be the best presentation conceivable, although it has been instrumental in the installation of 85 electric water heaters since November, 1936."

(Other prize-winning letters will appear in later issues of the News.)

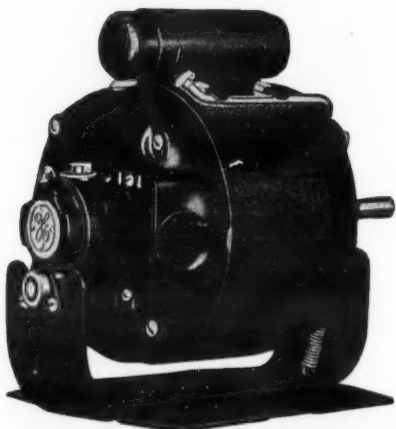
**Anaconda Copper Refrigeration Tubes**

Dependable!

THE AMERICAN BRASS CO.  
FRENCH SMALL TUBE BRANCH  
Lancaster, Pa. U.S.A.

## This MOTOR

pays Double Dividends



G-E motor for refrigerators—equipped with automatic-belt-tightener base

#### HELPS SELL NEW CUSTOMERS



HERE is Dividend No. 1: A man and wife, for example, come into your store to inspect your refrigerators. To them appearance is no indication of the quality of the important parts of your units; so they must judge by the reputation of the manufacturers who made the parts.

Here is where G-E motors help you, for they are assurance to prospects that the electric part of your unit is dependable. Impartial surveys indicate that the public prefers G-E motors. This acceptance, added to the acceptance of your appliances, reduces your sales problem largely to convincing prospects of the economies of domestic appliances.

#### BRINGS BACK OLD CUSTOMERS



DIVIDEND No. 2 is future sales to satisfied customers. These customers return to buy other appliances and to replace old ones. They also tell the newbies next door about you, and give you first chance at prospects who are just beginning to buy.

G-E motors give the service that makes satisfied users—they perform quietly year after year with little or no attention. Every design is tested in actual service before being adopted, and every G-E motor is given a two-hour running test in addition to the many tests that the parts must pass during manufacture. G-E motors do their part to make your customers satisfied. General Electric, Schenectady, N. Y.

LET G-E MOTORS HELP YOU SELL

**GENERAL ELECTRIC**

070-251



## THE COLD CANVASS

By B. T. Umore

(Concluded from Page 1, Column 1)

### Fancy Ice Cubes

A new use for electric refrigerators has been discovered in the Connellsville, Pa., territory.

During a recent hail storm in the area, the unusually large hail stones were kept in refrigerators, just to show those doubters who turn up after every such happening to say: "AW, they weren't that big!"

And folks probably were raising their eyebrows, for one jagged piece of ice 8 inches in circumference was reported, as well as some beautiful specimens showing geometric designs through the ice.

Which ought to give some inventive soul somewhere in this industry an idea. How about a hail stone in your cold drink, just to add a decorative touch?

Don't ask us how you could produce them.

### Have You Been Hooked On This One Too?

Bert Rymal of Electrical Appliance Sales, Hamilton, Ontario, Canada, has charged this one up to experience.

A few weeks ago a man he knew came into his store and said he believed he could sell a number of refrigerators. If he were successful would he receive a commission? Bert assured him he would.

Two days later he returned and announced he had made a cash sale. He took a roll of bills from his pocket and counted out the price of the refrigerator he had sold. Bert promptly handed him back his commission.

"Now, where do we send it?" Bert asked.

"Send it up to my wife," replied his "salesman" and roaring with laughter walked out of the store.

### Even the Fish Prefer Frosted Foods

People have been known to keep all manner of things in their electric refrigerators, but it remained for William F. Carbine of the Institute of Fisheries Research to recommend them as a storage place for fish worms.

"If you don't run into trouble with the missus, the best place to keep a small can of worms is in the refrigerator. Worms keep best when the temperature is less than 60° F. That is why they are hard to preserve in hot weather," Mr. Carbine says.

Old B. T. U. suggests that if worms are to be kept in the family refrigerator, they be hidden behind the beer. Keeping the can out of sight might save a lot of argument.

### A 'Gadget' To End All Gadgets

A "butler bed," gadget to end all gadgetry, has been developed by Frank Hasencamp, Chattanooga, Tenn. electrical contractor.

Punch a button on the bed. The radio will turn itself off after 12 minutes. Punch it twice—the radio will play for just 24 minutes.

If the radio fails to induce sleep, another gadget known as the "hypnotone" will do it. Then it turns itself off automatically.

If the air gets too cold or too hot, a thermostat closes the window or turns on a fan.

In a recess in the bedstead is the telephone. In other niche are books.

If somebody knocks at the front door, the bed's occupant merely touches a switch, and talks to the nocturnal caller over a loud-speaker telephone. In case he forgets to turn this device off, another robot reminds him. Nobody out in the street is going to hear him snoring via loud-speaker.

Alarm clock in the bed-end can't be turned off without getting out of bed. And if the drowsy sleeper crawls back into bed within a half hour, the peaky thing rings again.

## Carrier Will Turn Some Industrial Accounts Over To Distributors; Heating Line Added

(Concluded from Page 1, Column 4)

installations previously handled by the company direct are to be turned over to qualified distributors. However, some major accounts will still be handled by direct factory branches. This policy will broaden the activities of Carrier dealers and distributors, now engaged in commercial refrigeration and air-conditioning work.

Further tendency to "package" air-conditioning products was revealed in the introduction of a "knock-down" smoke house for industrial use, which will soon be placed in the hands of Carrier industrial distributors. The unit is shipped complete with burner, ready for assembly on the job.

L. R. Boulware, vice president of Carrier Corp., asserted that the company will undertake a more aggressive policy in the sale of room-

cooler units than at any time in the past, particularly in the case of quantity sales to hotels, apartment houses, and other commercial establishments.

As a companion unit to the Carrier portable room cooler, the company has announced two mechanical window-ventilators, to retail at \$59.50 and \$89.50. These units contain motor, filters, and centrifugal fans.

A complete line of residential heating and air-conditioning equipment was added to the Carrier line and placed in the hands of all dealers and distributors at the summer meeting.

This equipment includes oil and gas-fired direct winter air-conditioning units, oil and gas-fired boiler-burner units, anthracite and bituminous residential stokers, and a conversion oil burner.

The direct-fired gas and oil units

are available in 100,000-B.t.u. capacities, and are said to be priced competitively with the current market.

Officials of Carrier Corp. claimed that with the new line of residential air-conditioning and heating equipment, Carrier dealers and distributors now have one of the most complete lines of products in the industry, and are in a position to handle any commercial, industrial, or residential heating, air conditioning, or processing problem.

### First REA Grant Made For Co-op Locker Plant

(Concluded from Page 1, Column 4)

funds for the erection of such a plant. Pioneer Rural Electric Cooperative Co., Inc., was the first REA project to be completed in the United States. It now has more than 2,000 rural customers, and farmer-members have become a big potential market for household electric refrigerators and other electrical appliances.

## San Antonio Dealers Elect New Officers

(Concluded from Page 1, Column 1)

Moreland, Southern Equipment Co.; A. W. Noll, A. F. Beyer Co.; and Fred Lewis, Karotkin Furniture Co. The first three named directors are associated with local wholesale houses, while the remaining two are associated with retailers.

The office of secretary and treasurer has been left open for the time being. This is a non-paying office, and the duties will be rotated among the various members, one member to serve for a month, and each to be appointed by the president. Leon Walthall, who has been secretary and treasurer since the association was organized, resigned, and was voted a honorary life secretaryship.

Charles Lorenz, King's Furniture Co., is retiring president. He was acting president, taking the place of George Fake, who became associated with a local wholesale company during his term of office and resigned.

# This Employer Says...

... "THE THOUGHT ENTERED OUR MINDS TO Test THE CLAIMS OF THE INSTITUTE"...

... "WE ARE VERY GLAD TO REPORT THAT WE ARE More Than Satisfied" ...

The letter reproduced here is typical of the many letters we receive from employers in all parts of the country, and like the others, it came to us unsolicited. We had absolutely nothing to do with its wording. It appears exactly as we received it.

But it proves conclusively the dependable ability of men trained by the Refrigeration & Air Conditioning Institute.

Today, then, there is no need for you to risk the good name, success, and profits of your business on the guess-work of inadequately trained men when, thru the Refrigeration & Air Conditioning Institute, you can easily get a man to do your installation and service work who has been scientifically and practically trained to do this work the way it should be done, and the way you want it done.

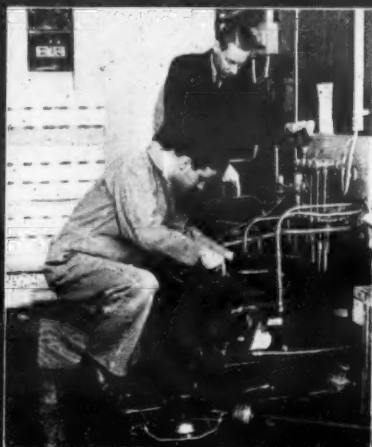
1000 hours of home-study, backed by two weeks (men graduating now are getting four weeks) of intensive work in our shops in Chicago where they have had to dismantle, rebuild, install, and service all conventional air conditioning and refrigeration equipment—makes our graduates, we believe, the most practical and competent installation and service men ever produced for any industry. And so thorough has been their training,—and so wide its scope,—that it is very likely that many of these men will, as some have already done, eventually go far beyond the service stage and become first-class Sales or Application Engineers. In fact we have among our graduates, men of all kinds—from men with little or no experience other than our Training, to men with years of experience; among them many college trained engineers.

This New Type of Craftsman—for it is a new type of craftsman that has been created,—has been trained especially to fit your needs. And so well is this job of Training being done,—and so careful is the Institute in selecting men for Training,—that, today, more than a hundred manufacturers in the industry are officially endorsing the Institute's work, and are unhesitatingly recommending its graduates to the consideration of their thousands of distributors and dealers, everywhere.

Be on the safe side by selecting your refrigeration and air conditioning employees,—service men, installation men, sales engineers, and application engineers from men trained by the Refrigeration & Air Conditioning Institute. The individual qualifications of every graduate are recorded in a form which enables you to select at a glance the man best suited for your needs. And as our services are free to employer and graduate alike, don't hesitate to let us help you.

*Raymond Smith*  
PRESIDENT

TRAINING IS SUPERVISED BY A MANUFACTURER-APPOINTED BOARD OF GOVERNORS



**REFRIGERATION & AIR CONDITIONING INSTITUTE**  
2130-2158 LAWRENCE AVENUE • • • • • CHICAGO, ILL.



# Air Conditioning

## Mathis Promotes Philco Room Cooler Sales

PHILADELPHIA — Appointment of Howard D. Mathis as special "Cool-Wave" representative for Philco Radio & Television Corp. in the air-conditioning field has been announced by Thomas A. Kennally, sales manager of the company.

Mr. Mathis will concentrate his activities in the sales promotion field, working with Philco distributors in every section of the country on the room cooler campaign.

## Bank Business Increase Laid To Conditioning

MANCHESTER, N. H.—Pointing out that the comfort of air conditioning and cheerful surroundings is as great an advantage in banking as in any other phase of public service, Harry C. Jones, executive vice president of the Manchester Federal Savings & Loan Association, declared that the air-conditioning system in his bank's new quarters was partly responsible for the bank's 29% increase in mortgage financing this May, compared to April.

## San Francisco Roof Bar Adds Conditioning

SAN FRANCISCO—Ventilation of the "Sky Room," glass-enclosed cocktail bar on the 24th floor of the Empire hotel here, is provided by a new air-conditioning system.

Converted from an apartment floor to a glass-enclosed room, the "Sky Room" is built with plate-glass walls to give patrons a four-way view of the city from any table in the bar.

To provide adequate ventilation for the large number of people who frequent the bar, a fan system with a variable speed exhaust and a constant supply of 100% outside air was installed. Large ducts were used to maintain air velocities at a minimum.

One complete air change is made every six minutes in the 24,000-cu. ft. space. Due to the constant San Francisco temperature, outside air with no recirculation was used exclusively. This made it possible to separate the supply and exhaust systems completely, thus conserving space.

In the bar interior, air outlets were planned to keep any possible draft from the windows because of the crowds there.

## Baker To Distribute G-E In 5 Ohio Counties

CLEVELAND — Ira E. Baker Co. has been appointed as authorized distributor of General Electric automatic heating and air-conditioning equipment in Cuyahoga, Geauga, Lake, Lorain, and Ashtabula counties. The firm will handle a complete line of automatic gas and oil furnaces and boilers, as well as air-circulating and exhaust fans and room coolers.

Mr. Baker, who has been active in gas heating work in this vicinity for the past 20 years, explains that his company will work closely with the prospective home builder, as well as the architect and building contractor.

## Air-Maze Buys Building In Expansion Plan

CLEVELAND — Air-Maze Corp., manufacturer of air filters and other apparatus for air conditioning, has bought a single-story building at 5200 Harvard Ave. here for future development, Albert E. Schaaf, president, has announced.

## 23 Philadelphia Theaters Install Air Conditioning

PHILADELPHIA — Air-conditioning systems have been installed in 23 Philadelphia theaters during the first five months of this year, according to reports compiled by Philadelphia Electric Co.

## Water Disposal Zoning Sought In Madison

MADISON, Wis.—Following an extensive study of all phases of water use and disposal in connection with air-conditioning equipment, a special committee has submitted five recommendations to the city council.

Increased use of water for cooling will not overtax the water system, but rather provide an attractive increase in the water department's revenues, it was found. The sanitary sewage facilities in some parts of the city, however, are operating at capacity, making disposal of waste water through that system undesirable. The obstacle could be overcome, however, by disposing of waste air-conditioning water through storm sewers.

The committee's recommendations were:

1. That in any location where the capacity of the sanitary sewer system has been reached, no connection for air conditioning to the sanitary system should be permitted.

2. That in all other locations, residential units of a capacity not exceeding 1,500 gallons in 24 hours may be connected to the sanitary sewer system.

3. That all other air-conditioning units must be connected to the storm sewer system and if no storm sewer is available, the city engineer may permit water to be discharged through the sanitary system if an evaporative condenser or cooling tower is installed which will limit the discharge to 1,500 gallons per 24-hour day or less, provided that the installation is in a district where the capacity has not been reached.

4. That special permits be taken out for any inspection of air-conditioning equipment so a record may be available and proper inspection follow to avoid hazards.

5. That the city attorney pass upon the legal features involved and draft a suitable ordinance embodying the recommendations.

Members of the committee were Leon A. Smith, city water superintendent; H. O. Lord, engineer for the Madison Metropolitan Sewerage District; T. F. Harrington, city engineer; Gordon E. Nelson, city building commissioner; and O. S. Pressentin, city plumbing inspector.

## Portable Room Coolers Prominent In Summer Furniture Market

CHICAGO—Portable room coolers occupy a prominent spot among exhibits of home furnishings and equipment at the mid-summer furniture market being held in American Furniture Mart here through July 16.

Room coolers being shown at the market include the Johnson "Space Cooler," manufactured by Johnson Motors, Waukegan, Ill., and listing at \$159.50; the "Koolroom" self-contained units manufactured by Indian Products Corp., Chicago, and ranging in price from \$175 for the ½-ton unit to \$1,350 for the 5-ton console model; the "Electrohome" unit, made by Welbilt Appliance Corp., designed principally for cleaning and circulation; and a unit 2 feet high, 1½ feet wide, and 11 inches deep, manufactured by Kreuger Mfg. Corp. of Chicago.

Said to be capable of filtering, washing, and cooling the air in a small office or room, the Kreuger unit was shown in the exhibit space of S. H. Danziger sales organization of Chicago.

## Conditioning Boosts Coffee Drinking In Market

NEW ORLEANS—Because the cooler atmosphere induces customers to drink more coffee, business at the "Morning Call Coffee" stand in the French Market here has picked up greatly since the installation of a Yorkaire self-contained air-conditioning unit by Jordy Bros., Inc., company officials claim.

## Soo Line 'Mountaineer' To Be Air Conditioned

MINNEAPOLIS—The Soo Line railroad's "Mountaineer," operating between the Twin Cities and Vancouver, B. C., Canada, will be completely air conditioned this summer for the first time, announced H. M. Lewis, general passenger agent here. Coaches as well as other cars on the train will be air conditioned.

## Air-Conditioning Installations In Detroit In May

(Data Compiled by The Detroit Edison Co.)

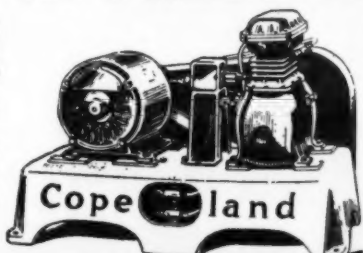
Central Station Equipment		
Classification	Installation	Hp.
Norge division of Borg-Warner Corp.	York	180
Birmingham Theater	Airtemp	100
Alger Theater	Carbondale	65
Norwest Theater	Carbondale	80
Chrysler Corp. (Highland Park)	Airtemp	16
Murray Corp. of America	Airtemp	15
Roosevelt Theater	Carrier	100
Sam's Cut Rate	Carrier	50
Kinsel Drug Co.	Carrier	15
Ford Motor Co. (Moved from Dallas Exposition Bldg.)	Carrier	400
Self-Contained Unitary Systems		
Dexter Dairy Co.	1 Airtemp	5
Dr. Kloeppel	1 York	3
Hugh Connelly & Sons	1 Airtemp	3
Richard Klein	2 General Electric—3 hp.	6
Dr. Miller (Office)	1 Carrier	3
E. D. Stair	1 Carrier	3
Congress Smoke Shop	1 Kelvinator	3
Bungalow Cigar Store	2 Airtemp—5 hp.	10
Room Coolers		
Arthur G. Rigley (Mortuary)	2 Hercules—1 hp.	2
General Motors Corp.	85 Frigidaire—¾ hp.	64
Jos. A. Jeffery	2 Westinghouse—½ hp.	1
Mr. Unger	1 Hercules	¾
Central Station Residence Systems		
Vaughn Reid	Airtemp	3
Henry S. Morgan	Brunner	5
Well Water Systems		
Haab Bros., Ypsilanti	½-hp. pump	
Vogue Beauty Shop, Ann Arbor	3 Goldenrod Coolers	
Moore Funeral Home, Ypsilanti	1 Goldenrod Cooler	

## Build both PROFITS and PRESTIGE with Copeland

### Commercial Refrigeration

There's a double satisfaction in selling Copeland Commercial Refrigeration. First, of course, is the extra PROFIT offered by this quality-line. And second, there's the satisfaction of knowing that every Copeland you sell adds to your reputation and prestige.

Write today for FULL FACTS about Copeland's profit opportunity.



COPELAND REFRIGERATION CORPORATION, Sidney, Ohio



How Refrigeration Men prevent gray hairs

BY SPECIFYING  
**FEDDERS**  
**ALL COPPER COILS**

Conservative, accurate ratings . . . ample prime surface in minimum space . . . copper fins and copper tubes . . . elimination of electrolysis . . . tubes expanded against flanged hard copper fins with 3,000 pounds hydraulic pressure assuring permanent metal-to-metal contact . . . thorough cleaning and absolute dehydration,—those are a few of the advanced engi-

neering features that make Fedders Coils sell and STAY SOLD.

The complete line of standardized sizes provides the right coil for every job, and simplifies selection and installation.

Satisfactory performance in thousands of installations proves that it pays to install Fedders Coils and Valves.

PROMPT DELIVERY TO THE TRADE FROM WAREHOUSE STOCKS AT

Atlanta Chicago Detroit Boston Cincinnati Los Angeles Philadelphia Buffalo Dallas New York

**FEDDERS**  
MANUFACTURING COMPANY  
BUFFALO, N. Y.



## 219 Systems Installed In Chicago In 6 Mos.

CHICAGO—Central-plant air-conditioning systems contracted for in Chicago during the first six months of this year totaled 219, according to reports compiled by Commonwealth Edison Co., electric utility.

Aggregate capacity of these installations was 3,044 hp. This compares with 307 installations, with a combined capacity of 9,722 hp., sold in the corresponding period of 1937. Air-conditioning contracts closed in June totaled 51, as compared with 60 in the same month last year. Combined capacity this June was 513 hp., compared with 1,573 hp. in June, 1937. A total of 111 room coolers also were sold in June of this year.

Ranking first on the list of air-conditioning contracts reported in the first half of this year were restaurants, with a total of 67. General offices were second, with 29, clothing stores third, with 19, and funeral parlors fourth, with 18.

In addition to the 219 central-plant type systems, 207 room coolers were sold during the six-month period. These units were chiefly for use in private offices and residences.

Central-plant contracts during the first half of the year were divided as follows:

Restaurants .....	67
General offices .....	29
Clothing stores .....	19
Funeral parlors .....	18
Drug stores .....	14
Candy stores .....	12
Beauty parlors .....	7
Shoe stores .....	7
Residences .....	5
Theaters .....	5
Private offices .....	4
Food stores .....	4
Churches .....	3
Doctors' and dentists' offices .....	3
Industrial plants .....	3
Fur stores .....	3
Studios .....	3
Miscellaneous stores .....	3
Amusement parlors .....	2
Banks .....	2
Hotels .....	2
Civic buildings .....	1
Bakeries .....	1
Printing plants .....	1
Candy plants .....	1

## Walt Disney Movie Studio Cooled For Artists

HOLLYWOOD, Calif. — Mickey Mouse, Donald Duck, Snow White, the seven dwarfs, and the legion other animated cartoon characters emanating from the Walt Disney studios doubtless will sport more satisfied smiles now that the studio in which their creators labor has been air conditioned.

The system used in the Disney studio was devised by Harold Stockly, Los Angeles consulting engineer. Fresh outside air is drawn in through Trane cooling coils, thus lessening the moisture content of the air before it enters the building. A portion of this air is then mixed with the return air from the building and discharged from a cooling tower.

Though pen-and-ink drawings in themselves may not be subject to fits of temperament such as periodically affect most screen actors, the work of the 570 Disney artists who create these drawings is influenced considerably by the conditions under which they labor, and it was for this reason that the air conditioning was installed.

## Mersfelder Heads Indiana Sales of Airtemp Outlet

INDIANAPOLIS — J. W. Mersfelder has been appointed sales manager for the Indiana district of Indiana Temperate Air, Airtemp distributor here, according to an announcement by C. P. Meyer, general manager.

Mr. Mersfelder was transferred recently from Cincinnati to Indianapolis.

## Madison, Wis. Mayor Installs F-M Cooler In Office

MADISON, Wis.—Fairbanks-Morse Ortho-Clima air-conditioning unit has been installed in the office of Mayor James R. Law in the city hall here.

## Store Opening Visitors View Cooling System

MACON, Ga.—Chief attraction for the 3,000 visitors who tramped through the new three-story home of Dillard-Kingston Men's Wear Shop at the formal opening here recently was the store's year-around York air-conditioning system.

The system was installed as a result of an extensive inspection tour by H. A. Dillard, vice president, during which he studied modern men's stores in other cities. Included in the equipment are two York C-1000 air conditioners and one York 466-FWD Freon condensing unit.

Installation of the system was made by Brittenham & Whitney, Macon distributor for York.

## Will Condition Theater

OIL CITY, Pa. — Air-Controls, Inc., Cleveland, has been awarded the contract for air conditioning the Lyric theater here.

## New Yorkers Dance the Hot Rhumba In Cool Comfort When 'Cuban' Night Club Installs Conditioning

NEW YORK CITY—Down in Cuba, they do the rhumba under native climate conditions. New Yorkers are not Cubans, however—and so La Conga, one of the city's most distinctive night spots, has tempered its "Havana in New York" atmosphere through the installation of year-around air-conditioning equipment.

Idea of air conditioning the club for the comfort of diners and dancers alike was first considered last fall, and became extremely active with an early spring heat wave. The order was placed with Schwerin Air Conditioning Corp., General Electric distributor in New York City, and within 10 days after plans were approved the installation was operating.

Equipment consists of two G-E compressors, one of 10 and one of 30 hp., and two standard factory-built year-around air conditioners,

types HD-200 and HD-600. The engineers reversed an existing exhaust system, employing ducts that were already in place for ventilation with minor additions.

The La Conga establishment is on two levels, accommodating 100 persons in the cocktail bar at street level, and as many as 400 persons in the dining and dancing area downstairs. Because of low ceilings, it had a large latent heat load. Both compressors and the large air conditioner were installed in an equipment room in the basement, and the smaller air conditioner was mounted in the ceiling of the upstairs room. The equipment room had formerly been used for lockers.

One of the novel situations which arose in connection with the installation involved the larger lower level area. This extends out and under adjacent Sixth Ave. sidewalks, which are exposed to the direct rays of

the sun during the day and store up, considerable heat.

Supply pipe of the New York Steam Corp. for the building also passed between the sidewalk and the ceiling of the dining room below. Although insulated, it added to the sensible heat load.

Air-conditioning engineers solved the problem by exhausting this hot air through the dining room ceiling, drawing it out along with the air exhausted from the La Conga kitchens, and allowing conditioned outside air to circulate in the area.

Large amounts of fresh air are required by the system, and reheating by steam is necessary. The two air-conditioning units have a total capacity of 11,800 c.f.m. Owners of the club were insistent that the system provide year-around conditioning, with an appreciable amount of cooling during the winter months.

Anemostats, or special ceiling units which both remove smoke and act as outlets for the conditioned air, are used for the most part over the bar and dance floor, in order to provide maximum cooling at those points.

# First THE CRACK RAILROAD TRAINS

Below: One of the compact refrigerating units, rolled out for inspection, installed in 140 buses of the Interstate Transit Lines (Union Pacific and Chicago and North Western Stages) operating between Chicago and the Pacific Coast. Installations by the Baker Ice Machine Co., Omaha.

# the world's first fleet of AIR CONDITIONED BUSES ARE COOLED BY "FREON\*-12" REFRIGERANT

**T**he Baker Ice Machine Company faced some tough problems in refrigerating buses for Mojave Desert duty. Temperatures up to 125 degrees. Sun radiation. Thirty-six people to keep comfortable in close quarters...

No wonder they chose "Freon-12" refrigerant to handle the heavy cooling load! For "Freon" refrigerants have consistently proved their effectiveness...not only in ordinary building installations...but also in unusual installations where conditions

are rigorous and requirements exacting.

"Freon" refrigerants are non-poisonous, non-flammable, non-explosive. They are practically odorless when mixed with air up to 20% by volume. They will not harm foods, furs, flowers, or clothes. They have been tested by the U. S. Bureau of Mines, and meet all the specifications set by the Underwriters' Laboratories of Chicago.

Make sure "Freon" refrigerants are included in your specifications for air conditioning.



# FREON

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safe refrigerants

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KINETIC CHEMICALS, INCORPORATED, TENTH & MARKET STREETS, WILMINGTON, DELAWARE



## Commercial Refrigeration

### Fedders Units Cool Furs In Bank's Vaults

NEW ROCHELLE, N. Y.—A cork-board-lined vault cooled by six Fedders model 164H series "73" unit coolers has been opened in the basement of the First National Bank here as a storage place for valuable furs and rugs.

The system provides for sudden chilling to kill moths or other parasites, but it is thermostatically controlled to maintain a temperature of 36° F. before and after this demoting cycle.

Each of the six Fedders units is placed so that it diffuses the air along the aisles and above the racks, thus providing ample circulation and uniform temperature throughout.

The compressor is located in an adjoining room. An evaporative condenser is incorporated into the system to provide economical and efficient operation.

John R. Burton, Fairview, N. Y., was the installing contractor.

### Mississippi Farmers Seek Storage Plant

NATCHEZ, Miss.—A mass meeting of Adams county farmers will be held here soon to gain support for a cold storage plant for conservation of meat, peas, seed, and other agricultural products.

Plans for the project have been submitted to Works Progress Administration officials with a request for labor to aid in construction.

### New Vegetable Freezing Plant

ELMA, Wash.—Washington Frosted Foods Co. will build a vegetable freezing plant here at an approximate cost of \$100,000.

### She Rings the Bell on Commercial Sales



SARAH BRENNER

CHICAGO—While many a male dealer mopes over slumping sales, Miss Sarah Brenner, assistant sales manager of Nathan Cohen & Son, fixture dealer with headquarters at 1011 W. Madison St., has gone after old man sales resistance with redoubled vigor to prove that, after all, business is still pretty much what you make it.

Mills Novelty Co. regards Miss Brenner as one of its star commercial refrigeration salesmen—and rightly so, for in one week recently she sold seven complete commercial installations, each one specifying a Mills compressor. And all of her other refrigeration equipment sales are Mills equipment sales, too.

Records show few women salesmen in the commercial refrigeration field. Executives of the Mills Novelty Co. point to her record in claiming for her the championship of her class.

### New Tyler Fixture Is 'Triple Refrigerated'

NILES, Mich.—A line of triple-refrigerated produce display cases known as "Treasure Island" cases has been announced by Tyler Fixture Corp. The line was introduced to merchants from all parts of the country at the recent National Retail Grocers convention in Cincinnati.

An open display shelf on top of the case provides for contact cooling of such items as tomatoes, berries, melons, cucumbers, and other fancy fruits and vegetables. This shelf is not designed for preservation and storage.

Inside the case, behind lightweight, easy sliding, double-glass doors, produce displays can be arranged as desired on adjustable wire shelves. Through these doors and through service doors at the rear, both customers and clerks have easy access to the merchandise that is on display.

Third refrigerated space is the storage compartment in the lower part of the case. This compartment is designed for all types of produce which should be kept under refrigeration, and is intended to eliminate the extra handling involved in changing produce back and forth from sales counter to cooler.

These cases have the usual Tyler welded steel shell, and have extra-heavy, 16-inch coils, with 2-inch fins, running the full length of the case. They are wired for standard light bulbs, the bulbs being located within the case to eliminate glare.

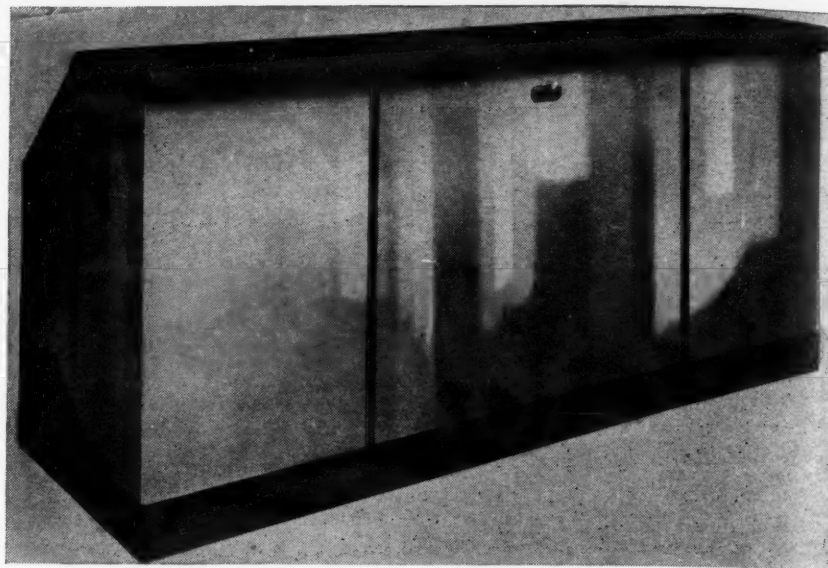
Available in 6 and 9-foot lengths, the cases are insulated with 3 inches of Armstrong's Temlok in the bottom, and 2 inches of Armstrong's Corning Wool in walls. Height of the cases is 44 inches; depth is 35 inches. Finish is vitreous porcelain enamel, standard colors being black and white, though others are available.

Dry produce displays, not insulated or refrigerated but matching the refrigerated cases in size, style, and finish, are available, as are compressor counters to cover the operating mechanism if so desired.

### Beal Heads Branch For Georgia Wholesalers

COLUMBUS, Ga. — William L. Beal has been appointed manager of the Columbus division of Georgia Wholesalers, Inc., Kelvinator distributor here.

### New Beverage-Cooling Fixture By Koch



The 'ZeroStream,' new dry bottled beverage cooler announced by Koch Refrigerators, is said to cool beverages by below-freezing temperatures.

### New 'ZeroStream' Cooler Offers Beverage Cooling At Below-Freezing Temperatures

(Concluded from Page 1, Column 4) contain sugar, alcohol, and other ingredients, beverages do not freeze at 32°, and so can be cooled safely as low as 28°, say Koch officials.

Tested in the Koch laboratory for more than a year, and in actual use in southern climates for more than six months, the ZeroStream cools beverages by a rapidly circulating stream of air. This method, keeping the interior of the cooler absolutely dry, eliminates the necessity of fishing for bottles in cold water, soaking off labels, and necessity of drying off bottles before serving, it is claimed.

Rapid cooling is possible with the new cooler, say Koch officials. In controlled tests conducted in a room held at a constant temperature of 96°, warm bottles of Coca Cola are said to have been cooled to 27° in less than an hour total time. One southern tavern keeper, who has been using one of the coolers for beer, serves the drink at 18° and advertises "the coldest beer in town," it is reported.

Interior of the cooler's storage compartment, being dry, is sanitary and complies with all the various states' regulations regarding storage of bottles in beverage coolers, the company says.

Available with capacities of either 18 or 36 cases of bottled goods, and

with or without provision for self-contained condensing unit, the ZeroStream is equipped with refrigeration coils and air circulator, and may be used with any condensing unit using methyl chloride, Freon, or sulphur dioxide.

The cooler can be used either as a back bar or as a front service bar. Metal dividers are used to separate the different types of beverages, and a full-length shelf, on top of the partitions, can be used for frosting glasses or storing food products.

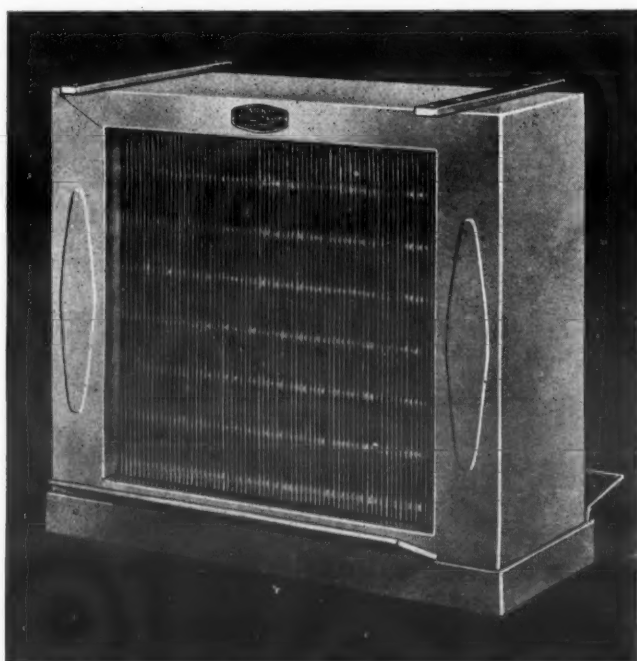
Optional equipment includes a special linoleum top, which enlarges the counter space to a width of 25¼ inches, providing space for lunch counter service. Top is edged with stainless steel. Grill to close the rear of the compressor housing, on self-contained models, also may be had, if desired.

Front, rear, and both ends of the unit are finished in white Dulux, and base plates and top are black porcelain enamel. Interior is rust-resisting steel. Insulation is 3 inches of Zeropak, moisture-sealed. Service doors, finished in black Dulux, are offset, overlapping, and gasketed.

They are hinged in pairs and removable in pairs to allow wide space for rapid filling of the cooler. Insulation in the doors is Zeropak. Door openings have black composition breaker strips on all four sides.

## Enthusiastically Approved by Delighted Users Everywhere The LARKIN HUMI-TEMP

- Scientific Design and Construction
- ★ Tremendous Fin and Tube Area
- ★ High Relative Humidity
- ★ Less Weight Loss from Stored Products
- ★ Superior Efficiency
- ★ Outstanding Performance



### An Installation Can Only Be as Efficient as the Cooling Unit You Put In It —

Why be vexed by the complaints and dissatisfaction that inferior equipment brings, when you can just as easily have the last word in Forced-Air Cooling, with Temperature and Humidity Control —

The famous Larkin Humi-Temp, standard throughout the refrigeration industry—the unit that is high in efficiency, low in operating costs, and never fails to do the job expected of it! Familiarize yourself now with its unequalled adaptability, economy and desirability—write today for illustrated descriptive literature, specifications and prices.

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Originators of the Cross Fin Coil

## Only M&E has all these Money-Saving Features

**POLYPORT SUCTION AND DISCHARGE VALVES** increase volumetric efficiency of compressors, save power, give you all the refrigeration you pay for.

**OIL CUSHIONED VALVE DISCS** prevent warping of valves from overheating.

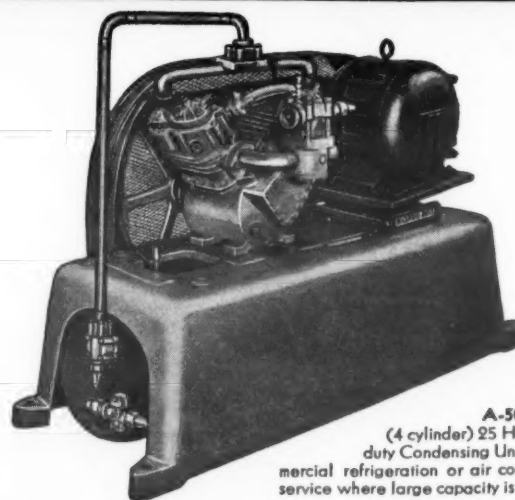
**AUTOMATIC SEALTIGHT SEALS** provide positive shaft seal at all times without wear on shaft.

**AUTOMATIC BELT TIGHTENER** regulates belt tension, prevents slippage and wear, saves belts and power.

**RELIEF VALVES** take care of oil slugs that may come through system, prevent breakdowns.

**ONE-PIECE CAST IRON BASE** absorbs and deadens vibration and sound, gives better foundation for unit.

**WATER COOLED SHELL AND COIL CONDENSERS**, counter-flow continuous circulating type. No clogging or periodic cleaning.



A-50,000-WF (4 cylinder) 25 HP., heavy-duty Condensing Unit for commercial refrigeration or air conditioning service where large capacity is required.

M&E equipment grew up with the electric refrigeration industry. For more than twelve years it has been continuously improved. M&E operating costs are low, refrigerating efficiencies are high, because of these improvements in design and construction... exclusive features, many of them... engineered as a result of long experience in the building of equipment for all refrigerating and air conditioning needs.

Let us tell you more about these features of M&E design... why it will pay you to select "M&E for the Plus Values in Electric Refrigeration"... Sixty-two models, ¼ HP. to 25 HP., Underwriter Laboratory approved, A.S.R.E. ratings, N.E.M.A. standards... ask for new catalog.

MERCHANT & EVANS COMPANY  
Philadelphia, Pa., U. S. A. • Plant at Lancaster, Pa.



## CONDENSING UNITS

for the Plus Values in Electric Refrigeration



## Commercial Refrigeration

### Florida Store Owner Estimates Refrigerated Vegetable Case Saves Him \$286 Yearly

SEBASTIAN, Fla.—Six months' records which show a reduction of produce shrinkage by 5½% through use of a Sherer-Gillett "Vegetaire" produce display case provide a double trail to profits for G. K. Murdoch, combination grocery store operator-refrigerator dealer here.

Besides giving Mr. Murdoch extra income from fresh vegetables formerly lost through shrinkage and spoilage, it also has provided him with a convincing sales argument to use on other merchant-prospects for produce display equipment.

Like many another small town business man, Mr. Murdoch does not limit his selling activities to one field. He also is a Westinghouse refrigerator dealer, and when he read about the new produce display case in trade papers about a year ago, his interest was aroused both as a user and as a salesman.

#### BOUGHT ONE HIMSELF

After correspondence with Sherer factory officials, he ordered one of the cases, sight unseen, for use in his grocery store. Convinced by his experience as a user, he shortly afterward applied for a dealer franchise.

Being now "on both sides of the fence," so to speak, Mr. Murdoch began keeping a chart on the length of time the Vegetaire would preserve various fresh foods without spoilage, and to record shrinkage or gain during the storage period. This chart, continued over a six months' period, furnished him with figures on the amount he was saving as a grocer, and gave him sales-clinching data to use on other grocer-prospects for the equipment.

#### LISTS SAVINGS

Listed on the chart are some 15 food items, including avocados, lettuce, lemons, rutabagas, rhubarb, green onions, spinach, green beans, peas, carrots, beets, cauliflower, broccoli, yellow crookneck squash, and celery. Mr. Murdoch's data shows that these items kept from periods of six to 13 days, with the notation after such items as lemons, and rutabagas that they "kept indefinitely."

Spinach kept for 13 days before color changed, and during that period the weight of the tested item increased 8%. Green beans were kept for nine days before color

changed, and a 5% weight increase was noted.

From his viewpoint as a grocer, Mr. Murdoch reports that being able to guarantee his customers fresh produce, without any variation from day to day, resulted in the doubling of his sales in this department during the six months' test period. With spoilage and shrinkage losses cut, he was able to stock a larger variety of vegetables, and push them harder than before.

According to his charts, shrinkage dropped to less than ½ of 1%, where before it had been about 6%. Estimating his weekly produce sales at \$100 the year around, Mr. Murdoch figures that his yearly saving from reduction of shrinkage losses alone amounts to \$286.

### 'Z' Freezing Process Now Used For All Types of Foodstuffs; System Is Improved

NEW YORK CITY—The "Z" process of quick-freezing foodstuffs is now finding use in a number of branches of the food industry, according to Van R. H. Greene, consulting engineer for the "Z" Pack Corp.

Swift & Co., Armour & Co., Cudahy Co., and the Borden Co. are using it for freezing chickens, he says. Curtiss Bros. of Rochester, N. Y. are using it for fruits and vegetables (mainly cherries, strawberries, and peaches). Vicana Foods Co. has a plant in Cuba using the system. The Atlantic Quick Freeze Co. is using it to freeze fish.

The "Z" Pack Corp. was formed in 1936, succeeding the American "Z" Corp., the original company formed to market the quick-freezing process invented by M. T. Zarotschneff, who came to the United States as a refugee from Russia in 1925, and who made contact with Mr. Greene, who was then president of the American Society of Refrigerating Engineers. The Frick Co. made

the original systems embodying Mr. Zarotschneff's idea.

Present company is headed by Paul Abbott, well-known Wall Street figure who is chairman of the board of Industrial Developments, Inc.

According to Mr. Greene, a number of improvements have been made recently in the "Z" process. The original system employed a continuous belt and an atomized salt brine spray.

In the new system the freezer consists of an insulated tunnel through which the product is carried on a wire mesh belt, and an invert sugar is used in the spray.

The liquid material used in the spray is run over a Baudelot cooler into a tank, from which it is pumped into the spray headers. The freezing temperatures in the tunnel are usually -3° F. The same pump that is used to pump the liquid into the spray headers is used to pull the liquid collected in the sump under the tunnel up over the Baudelot cooler.

In most cases it is desirable for the food to be taken from the freezing tunnel direct into below temperature storage facilities, said Mr. Greene.

Mr. Greene pointed out that the new "Z" system can be used in cold storage plants, since it is not a bulky piece of equipment, and requires little effort to erect the tunnel.

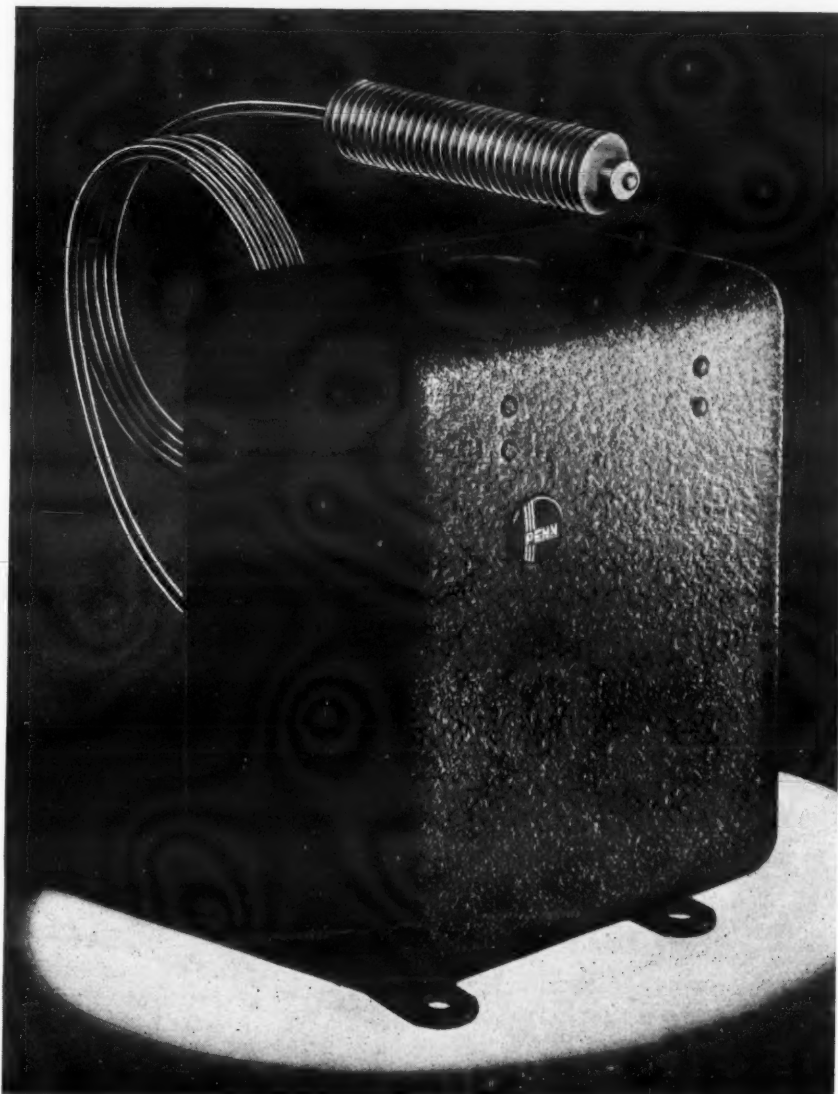
In fact the freezing tunnel can be constructed with two-by-fours and ordinary sheathing material, as long as proper thickness of insulation is provided.

Portable freezers can also be made, which will accomplish freezing of the produce at point of harvesting.

### Canadians Plan Storage Plant For Apples

CRESTON, B. C., Canada—Long, Allan & Long, Ltd. will shortly start construction of a modern cold storage plant to accommodate 15,000 boxes of apples, according to C. W. Allan, managing director of the company.

Part of the company's existing warehouse will be converted into a two-story structure, into which the cold storage plant will be installed.



# PENN nofrost CONTROL

## Complete . . . Simple . . . Dependable

### INSIST ON ALL OF THESE ESSENTIAL FEATURES

- 1—One simple unit for complete nofrost control.
- 2—Absolute freedom from coil frosting at any box temperature above freezing. Completely automatic.
- 3—Positive, close regulation of box temperature at any point above freezing.
- 4—Instant, convenient adjusting knob with calibrated scale for selecting box temperature. This adjustment may be located at the box or at the compressor, depending on the user's wishes.
- 5—Temperature control by means of a sensitive fin coil bulb—easily located at the best point for accurate control, without regard to accessibility.
- 6—Positive performance of all safety functions of the control system, regardless of the demands of other elements of the interlocked nofrost unit.
- 7—One simple, two-wire connection to compressor motor. No other wiring. Simplifies installation.
- 8—One control for all voltages and frequencies. Simplifies stocking problem for manufacturers, jobbers and service engineers.
- 9—All switching functions handled by one standard, enclosed Magneseal contact unit—snap-acting . . . vibration proof . . . trouble-free.
- 10—Easy accessibility for all service and installation requirements, including differential adjustments on box temperature regulator.

Investigate the Penn control system which incorporates complete compensation for seasonal variations—shorter than normal summer operating periods to prevent dehydration and shrinkage . . . Longer than normal winter operating periods to prevent sliming, discoloration and tanning.

### COMPRESSOR AND BOX CONTROL BALANCED BY PENN MECHANICAL INTERLOCKING SYSTEM

Out of Penn's laboratories and long years of intimate contact with the refrigeration industry comes this simple and most complete of control systems. Every item listed at the left is a tried and proved Penn control feature. Now, Penn offers all of these functions in one ingeniously simple, dependable, mechanically interlocked system, *all in one unit*. Reduces operating expense . . . cuts product shrinkage and losses. Insures maximum efficiency of all equipment—on new installations or remodeled jobs. Makes new business for manufacturers, jobbers and service engineers. Write today for information, or see your nearest Penn branch, representative or distributor. Penn Electric Switch Co., Goshen, Indiana. In Canada: Powerlite Devices, Ltd., Penn Electric Switch Division, Toronto, Ont. Branches, representatives and distributors in all principal cities.

Covered by issued and pending patents.

THE MOST COMPLETE CONTROL SYSTEM  
AVAILABLE . . . ALL IN ONE COMPACT UNIT

DESIGNED AND BUILT TO  
PENN'S REFRIGERATION  
CONTROL STANDARD



### Railway-Type Springs Used For Mounting

NEW ORLEANS—Use of coil springs to isolate heavy refrigeration machinery used in air conditioning for the purpose of eliminating unnecessary vibration has been done in conjunction with a 325-hp. York installation in the Jung hotel here.

The compressor, motor, and condenser are all mounted on a large concrete platform, which rests on 1-inch coil springs of the type used in railway cars. The concrete platform is "floated" on the springs about an inch from the floor of the hotel basement.

F. H. Snow, engineer of York Ice Machinery Corp. here, states that the "box-car" springs have proved highly satisfactory in this installation in cutting vibration and noise to a minimum.

Vibration in the refrigerant and water lines is absorbed by rubber couplings inserted in the pipes.

Consulting engineers on the Jung hotel installation were Leo S. Weil and Walter B. Moses.

### Craft & Brown Move Store To Fairmont

FAIRMONT, W. Va.—H. O. Craft and Charles T. Brown, who operated the Point Marion Norge Co. at Point Marion, Pa., for the past year, are moving their stock and business to Fairmont. Representatives of the firm will visit Point Marion once a week for sales and service of Norge appliances.



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## Space Heaters

UNHERALDED and unsung, the space heater industry has made one of the most rapid rises to eminence in recent American industrial history. A decade ago a space heater was simply something in a catalog, a newfangled kind of parlor stove which you sometimes saw in the back part of a furniture store. Today it is one of the largest selling specialty products on the market.

What is a space heater? Simply this: an oil-fired heating stove with forced air circulation. It replaces the old base-burner coal stove in homes which do not have central heating. Automatic and efficient, it is also an improvement in appearance over the coal stove, and a boon to the housewife who likes to keep her walls and curtains bright and spotless.

### Extraordinary Gains In Volume Registered

An unofficial set of figures developed by one of the leading manufacturers, and checked by competitors, shows the following remarkable rise in sales volume:

1931—82,767 units.

1934—331,784 units.

1937—1,352,046.

The really rapid period of expansion of space heater sales dates back to the time (about five years ago) when some of the larger factors in the business decided to go to specialty dealers for distribution. Last year refrigeration and appliance dealers really got into the business, with the result noted above.

### Advantages of Household Space Heaters

Space heaters are easily and quickly installed. They are portable—can be moved from room to room, house to house. And they appeal to housewives almost immediately, for it is the woman of the house who usually has to tend the coal heating stove. The space heater practically operates itself.

Retail list prices range from \$79.50 to \$119.50. Discounts to the dealer run from 30 to 40%, which is equal to or better than that offered on household refrigerators. Saturation mark is extremely low. There is no trade-in problem, for few householders seem to place much value on their old coal stoves.

Because the field isn't as yet overcrowded with dealers, there is no price-cutting situation on space heaters. They can be sold on time, although a surprisingly large percentage are cash sales. In other words, it's a good business for the dealer.

### Comprehensive List Of Non-Home Prospects

The market is not limited to homes at all. Here is a list of some of the places where space heaters are being sold this year:

Airports, apartment houses, athletic clubs, auditoriums, auto repair shops, bakeries, barber shops, beauty shops, beer parlors, book stores, camps, candy stores, cigar stores, churches, coffee shops, country schools, creamery stations, dentists' offices, department stores, doctors' offices, drug stores, small factories, implement stores, filling stations, fire and police stations, florists' shops, flour and feed stores, furniture stores, garages, general stores, golf and country clubs, grocery stores, public and private halls, hardware stores, hunting and fishing lodges, insurance offices, waiting rooms, jewelry stores, lawyers' offices, libraries, loan offices, lodge rooms, small offices, lunch rooms, meat markets, haberdashery shops, paint stores, photo studios, pool halls, print shops, radio shops, dance halls, shoe shine shops, real estate offices, summer cottages, tailor shops, taverns, taxicab offices, theaters, tire shops, school rooms, tourist cabins, tourist rooms, variety stores, warehouses, watchmen's houses, trucking offices.

### May Be Used In Summer, Too

Wholesale selling season runs from Aug. 1 to Jan. 1. Retail selling season extends from Sept. 1 to May 1, with the biggest volume available during the months when refrigerators and ranges are at their lowest sales ebb.

The larger units, equipped with strong air circulation, may be used during hot weather (without heating, of course) to circulate air and increase comfort. This is a comparatively new selling point, one which has proved especially effective this year.

There are a large number of manufacturers in the field, although a few strong ones dominate the market.

With a new selling season in the offing, here is a specialty product which the refrigeration and appliance dealer will do well to investigate.

## Business Trends Surveyed

THAT instalment selling shows big increases only in trades which register big sales gains, and that wholesalers and department stores control inventories better than other types of retailers and manufacturers, are two of the important findings of the Business

## They'll Do It Every Time . . . by Jimmy Hatlo



Trend Survey recently completed by Dun & Bradstreet Research & Statistical Division. This survey is based on the contributed experiences of some 40,000 concerns whose dollar sales volume totaled more than 20% of the nation's business.

### Factors In Recession Culled and Analyzed

No one cause can be pointed out in the evidence of the survey as the initiating force of the recession, although several factors are segregated as contributing agents.

Survey is the result of four months of intensive research work by Dun & Bradstreet, and covers the three-year period of 1935, 1936, and 1937. The original communication asked four basic questions:

### Four Basic Questions Asked By Dun's

1. What was your annual sales volume for the past three years—and what was the proportion of cash, instalment, and credit sales?

2. What was your inventory at the end of each of the past three years?

3. What were your receivables due at the end of each fiscal year?

4. What money was spent for physical improvements during the three-year period?

The findings of the survey point to these significant facts:

The extent of the upswing in sales of goods was greatest in manufacturing and least in retailing.

### Manufacturers' Inventories Much the Largest

Inventories in manufacturing are half again larger than wholesaling and retailing put together.

Inventories at the end of 1937 were \$5.3 billion greater than at the end of 1935.

Wholesalers seem to keep inventories in closer relationship to sales than either manufacturers or retailers.

In general those wholesale lines whose inventories are frequently reported and estimated in the press were among those with the heaviest inventory accumulations,

so that such current information is not a safe guide to the inventory position of wholesaling in total.

### Automobile Dealers Overstocked in 1937

Most retail trades did not record severe inventory accumulations at the end of 1937, motor vehicle retailers being the outstanding offenders.

Department stores were in a considerably more favorable inventory position at the end of 1937 than retailing as a whole; hence, the published monthly figures on department store inventories cannot properly be used as an indication of retail inventories in total.

Credit sales dominate manufacturing and wholesaling, but over 60% of retailing is on a cash basis.

Instalment sales increased greatly in 1936, not so much because of shifts from other methods as because the instalments were used mostly in trades having the greatest sales increases.

### Small Increase In Instalment Selling

Instalment selling increased very little in 1937, when the problem was being discussed most widely.

Manufacturers' and wholesalers' accounts receivable decreased during 1937, but retailers' investments in receivables expanded by 7%.

### Enormous Survey Teaches Lessons

This Business Trend Survey was the largest in scope ever conducted by any private fact-finding organization. A large staff of economists, analysts, and clerks were required to complete the physical labor of reducing the bulk information to percentages by trade and region; and the complete set of figures would no doubt interest most people engaged in manufacturing, wholesaling, and retailing.

Study of business statistics is, of course, largely a matter of second-guessing. One seldom gets the figures in time to do much about them. But it is true that we can make future decisions based on the lessons of the past—for which pursuit the Dun & Bradstreet compilations are undoubtedly valuable.

## LETTERS

### Status of Geographic Directory (No. D-2)

College Book Exchange  
619 Madison Ave.  
Toledo, Ohio

July 5, 1938

Sirs: We wrote you April 16 concerning our order of Aug. 7, 1937, for one copy of your Refrigeration and Air Conditioning Directory, Volume Seven of the Refrigeration Library. Although we have received part one of this, to date, we have not received parts two and three. If these are now available, we will appreciate your sending them at once. Otherwise, kindly give us a new report as to when we may expect them.

E. M. REID

Answer: We have been slowed down in our plans for developing new books due to general business conditions.

As you probably know, we formerly issued the Directory in the form of a rather thick book which sold for \$3.00 per copy. In it all manufacturers were listed four ways, alphabetically, geographically, by trade names, and by classification of products. We found that most users of the book were primarily interested in it as a buyer's guide and that the classified products section was most useful to them. Therefore, we decided to issue the classified products section with an alphabetic index, as a separate book. This book was offered at \$1.00 per copy in order to increase the circulation for the benefit of advertisers.

A more limited number of users of the Directory were interested in the geographical section and it was frequently suggested that the convenience of this group would be served better if the geographical section could be bound separately. To meet this need we have been working on a Directory (No. D-2) especially designed for those who are sellers of goods to the manufacturers (rather than buyers).

Since this new Directory (No. D-2) will contain no advertising and since the sale of copies will probably be too limited to justify its production cost, we have considered this job more or less as a service to the industry.

In brief, we want to render this service but we are trying to get the book compiled as a by-product job in order to keep the expense within reasonable limits. We hope to make more rapid progress during the next few months and will let you know when the book is ready.

### Book For Merchants

Tri State Electric Co.  
407 E. Eighth St., Sioux Falls, S. D.

Sirs: We have gone over the book "Appliance Selling Today" and we are sure that every one of our dealers should have this book and if they would read it, they could and probably would be better merchants.

HARRY FRANK



## Air-Conditioning Dealers Are Starting To Replace 'Hit or Miss' Selling Methods With Organized Effort

**Editor's Note:** This is the fourth of a series of articles by Mr. Smith discussing air-conditioning merchandising problems and methods. In this article he tells what some dealers have done to improve their selling effort.

By Mac Smith, Detroit Merchandising Counselor

A YEAR ago, the writer clipped four coupons from air-conditioning advertisements and mailed them to the manufacturers for information. After four weeks of waiting, in the midst of summer weather, he had received one telephone call, one folder direct from the factory, and only one sales solicitation. The fourth manufacturer never was heard from.

To find out whether that was just a local situation, he mailed four more coupons from a New York address. None of those were acknowledged, or followed up.

This year the test was repeated, with coupons being sent to only three manufacturers. The fourth, the one that had neglected the inquiry a year ago, is not an advertiser any more! But the three who are still alive all followed up the inquiry with salesman's calls within a week.

### PLANNED SELLING

That is the difference between waiting for buyers and going out and looking for them. It's the difference between running a supply business and putting on a merchandising operation.

The term "merchandising" which theoretical sales people use so glibly, means nothing more than planned, systematic, aggressive selling. And that's what's going on in the air-conditioning business, more today than before.

The business has developed to the point where it can be classified and organized. The market, as we have seen from data published previously in this series in AIR CONDITIONING & REFRIGERATION NEWS, has expanded in the small-tonsage brackets where it's more susceptible to specialty merchandising. And the people in the business are discovering many effective ways to make air-conditioning buyers out of sweltering prospects.

One of the leading manufacturers already has split his franchises in a number of the larger cities, giving the small-tonsage business to distributors or dealers who are set up on aggressive merchandising lines. Rumors persist that several of the others are looking sharply for the point through which they can draw the line between air conditioning activity that can be merchandised profitably and that which must be sold on engineer's specifications, because the "self-starting" market for air conditioning seems to be getting thin in comparison with the volume a salesman can get when he goes out after it.

### WIDE VARIETY

A study of dealer selling methods employed in different parts of the country discloses a wide variety of ideas about the best ways of digging up business.

A Boston dealer last summer tried out the most obvious method. He put four straight-commission salesmen on the streets with instructions to stop at every retail establishment and try to make a sale. The activity didn't cost the dealer much, because he paid no salaries. But one of the salesmen reports that he got pretty hungry before the summer was over, that he was more successful than the average, and that the turnover of men on the job was high.

Guided by experiences like that, 40 other distributors covered by this study decided logically that a selling season is not the best time to look for prospects. They set out the middle of last winter to make a systematic survey of their markets, finding out where air conditioning had already been sold, who was thinking of buying air conditioning, and who else was in position to use air conditioning profitably. This prospect information was carefully recorded, and filed for follow-up at the time when prospects would be in a mood to consider the purchase. Sales results from these distribu-

tors are not available at this writing. Informal information from the manufacturers who supply them indicate that on the average these distributors are ahead of last year's performance.

It would be surprising if the plan should not prove outstandingly successful, because it has undeniable merits. First of all, it provided profitable activity for air-conditioning men during the dull season of the year, so far as small-tonsage sales are concerned.

It gave these men an opportunity to find out what types of people already had bought air conditioning. It opened their eyes to the most common obstacles to the sale, the most common objections to be answered by the salesman. And it organized the sales program.

### LISTS PREPARED

This spring when the prospect cards were brought out, each dealer had an actual list of prospects to call on. Until he had covered every name on the cards, he knew he hadn't covered his territory. When a salesman walked in on a prospect, he already knew something about him and his needs.

Because the salesman was spared the job of sorting the live prospects from the duds, he faced less discouragement and worked more efficiently. That meant that a higher type of salesman could be sent out on canvass work, men with higher batting averages, who got a chance to go to bat more times a day.

Another sales plan, reported from Dallas, Tex., hits at the high cost of engineering. This dealer reasoned along these lines: "there's good competition in my territory, and we're all figuring pretty well in line. I'll get my share of the business if I put in my share of selling effort. But I could create a lot of additional prospects if I could find a way to cut my selling and engineering expense!"

### IDEA SAVES MONEY

One day when he finished laying out and figuring a job he checked his figures back against a similar job he'd sold the month before, and discovered that the second job was almost an exact duplicate of the first. His figures were safe, but he'd spent a lot of time and money on duplicate engineering that he could have copied right from the first job.

That gave him the big idea. He looked around the city for more one-room retail establishments of the same type and size as the two he'd already figured, and he found several.

Whether they were considering the purchase of air conditioning or not, he was able to make them attractive propositions, to offer lower prices, because his figures didn't have to include anything for engineering—that had all been done and paid for on the previous jobs. And he came back with some orders!

Today, every time he sells a job, he makes up a standard proposal for that type and size of establishment, and sends his salesmen out looking for prospects that fit the proposition. They can quote a price that's well under what a competitor would quote if he figures in engineering expense. They've got a demonstration installation to point to as evidence of the performance they can deliver, and they can promise quick installation.

The Dallas dealer says he makes more money on the duplicate installations than on the first, because when he can tell his installation crew to do the second job the same way they did the first, there are less questions and fewer complications.

Another distributor showed us some very elaborate data supplied by his manufacturer, for figuring load requirements, then dramatically dumped the whole works in the waste basket.

"That's invaluable information for the man who figures air condition-

ing," he said, "unless you have something better."

What he had that was better was condensed data that applied exactly to his local situation. The manufacturer's data covered the whole range of building construction standards and weather data across the country.

This dealer was selling locally. Local weather data was all that concerned him. He discovered that practically all buildings in his community were constructed alike. Also, that his customers were satisfied with comfort conditions slightly under the average standard for the entire country. He had condensed whole chapters of data into a few simple factors that enabled him to figure jobs quickly and accurately on the spot. And closely!

### WORK FAST

His sales plan is "Close 'em while they're hot." That seems to be a very generally accepted principle of effective air-conditioning selling. Many dealers say that air-conditioning prospects cool off fast, and if they can quote a price on first call they stand a much better chance of getting the order.

The newer forms of "packaged" or self-contained air-conditioning equipment have made it much simpler to figure accurately and quickly on the spot. Much of the pre-engineering data supplied by manufacturers today is very comprehensive and accurate. But the man who has boiled this down and simplified it to fit his local situation seems to be able to figure quicker and closer, and close figuring, if it's within limits that are safe, often spells the difference between an order and a lost sale.

There's a precautionary measure against errors in figuring that seems to be coming into widespread use. Order agreements made out by salesmen are worded "subject to acceptance." That puts the prospect on the dotted line without putting the dealer on the spot.

When an order comes in, the engineer checks the layout, refigures the load requirements, and rechecks all prices. He can afford to do it thoroughly and carefully, because he's going to be paid for it if the salesman didn't make a mistake. And if he does find a costly error, the dealer has a legal out.

### TWO BIDS MADE

Competitive bidding on engineer's specifications seems to be a headache for almost every air-conditioning organization. The designing engineer may have been more conservative than necessary. He may have been impractical.

At least, that's the way a Chicago firm felt about it. They felt also that the winner in bidding on specifications frequently is the man who made a costly error in his figures. But lost business meant lost position even if the competitor didn't make a profit.

This organization seems to have had considerable success by presenting two bids for each job. One "as specified" and a second, where they found opportunities for cutting costs without impairing performance, "as recommended." It sometimes puts the engineer in a bad light, and that's something to consider seriously and to handle diplomatically, but it may make an appeal to the prospect.

The question which every air-conditioning dealer must decide, in considering this practice, is whether he can get by with it without incurring ill will that will eliminate him from bidding on future jobs designed by the same engineer.

Out of all of the sales practices observed, these points stand out: Successful dealers, particularly those concentrating on the small-tonsage "Main Street" market, are merchandising more aggressively than before.

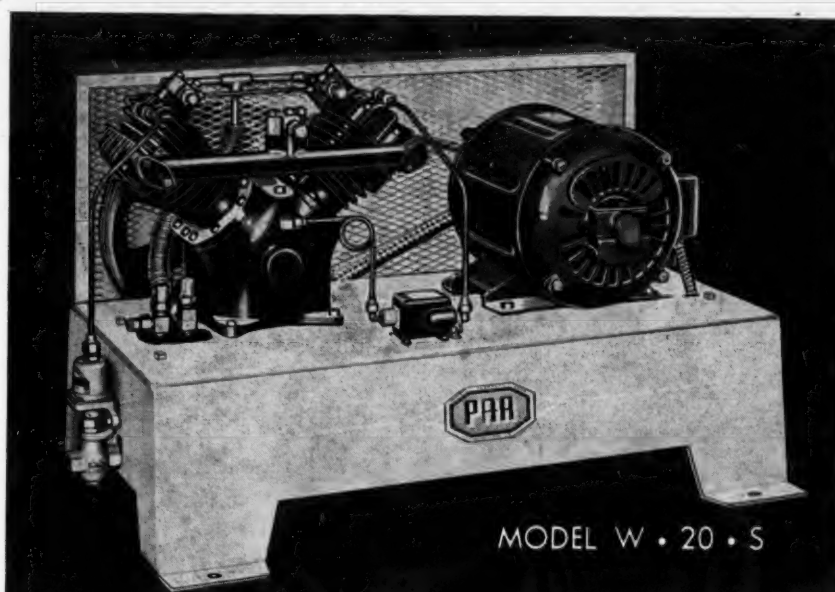
There are dozens of effective ways of digging up business, but there seems to be no single plan that best fits the needs of all dealers.

Leg work, blanketing a market with salesmen, is successful only when it is organized on a basis that will support highly competent men and keep them on the job.

Cutting costs for the buyers opens up a bigger market. And there are ways of doing it that need not reduce profits for the dealer.

Quoting prices on first call beats drawn-out sales negotiations.

And, in the over-all, planned action based on sound knowledge of the local situation, beats disorganized sales activity. There are more air-conditioning prospects waiting to be sold than there are people who are asking for bids!



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For Refrigeration Economy

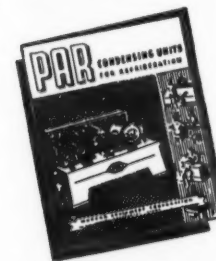
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- There are six compressor bodies and twenty-eight complete highside in the Par line, in a range of sizes from  $\frac{1}{4}$  to 20 horsepower.



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| Akron, Ohio<br>Percy G. Hanson                                              | Indianapolis, Indiana<br>F. H. Langenkamp, Inc.                                  | Portland, Oregon<br>Refrigerative Supply Co.                           |
| Atlanta, Georgia<br>Bowen Refrigeration<br>Supplies, Inc.                   | Jacksonville, Florida<br>The Jamita Co.                                          | Richmond, Virginia<br>A. R. Tiller, Inc.                               |
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| Cleveland, Ohio<br>Debes & Co.                                              | Minneapolis, Minnesota<br>Refrigeration & Indus-<br>trial Supply Co.             | Spokane, Washington<br>Ditlevsen & Evans                               |
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| Dallas, Texas<br>The Electromotive Corp.                                    | Newark, New Jersey<br>Melchior, Armstrong,<br>Dessau Co.                         | Springfield, Mass.<br>Melchior, Armstrong,<br>Dessau Co.               |
| Davenport, Iowa<br>Republic Electric Co.                                    | New Orleans, Louisiana<br>The Spangler Co.                                       | St. Louis, Missouri<br>The Spangler Co.                                |
| Dayton, Ohio<br>W. H. Kieffer Co.                                           | Newport News, Virginia<br>Noland Company                                         | Tampa, Florida<br>Bowen Refrigeration<br>Supplies Co.                  |
| Denver, Colorado<br>Refrigeration Service Co.                               | New York City, N. Y.<br>Melchior, Armstrong,<br>Dessau Co.                       | Toledo, Ohio<br>Heat and Power<br>Engineering Co.                      |
| Detroit, Michigan<br>W. C. DuComb Co., Inc.                                 | Oklahoma City, Oklahoma<br>Mideke Supply Co.                                     | Tulsa, Oklahoma<br>Machine Tool &<br>Supply Co.                        |
| Des Moines, Iowa<br>Dennis Refrigeration<br>Supply Co.                      | Omaha, Nebraska<br>Interstate Machinery &<br>Supply Co.                          | Washington, D. C.<br>Melchior, Armstrong,<br>Dessau Co.                |
| Flint, Michigan<br>Shand Radio Specialties                                  | Oshkosh, Wisconsin<br>Gustave A. Larson Co.                                      | Waterloo, Iowa<br>Winterbottom Supply Co.                              |
| Ft. Worth, Texas<br>McKinley Refrigeration<br>Supply                        | Peoria, Illinois<br>R. E. Thompson Co.                                           | Wichita Falls, Texas<br>United Electric Serv. Co.                      |
| Greensboro, N. Carolina<br>Home Appliance Serv. Co.                         | Philadelphia, Pa.<br>Melchior, Armstrong,<br>Dessau Co.                          | Toronto, Canada (Ont.)<br>Railway & Engineering<br>Specialties, Ltd.   |
| Harrisburg, Pennsylvania<br>Melchior, Armstrong,<br>Dessau Co.              | Pittsburgh, Pa.<br>William Orr Company                                           | Montreal, Quebec, Canada<br>Railway & Engineering<br>Specialties, Ltd. |
|                                                                             |                                                                                  | Winnipeg, Man., Canada<br>Railway & Engineering<br>Specialties, Ltd.   |

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## The Refrigerator, Range, and Washer Sales Picture By Years

Year	Wired Homes	Electric Refrigerators				Ranges				Washers			
		Sales Cumulative Total By Years	% To Wired Homes	Sales By Years	Percentage Of Gain Over Prev. Year	Sales Cumulative Total By Years	% To Wired Homes	Sales By Years	Percentage Of Gain Over Prev. Year	Sales Cumulative Total By Years	% To Wired Homes	Sales By Years	Percentage Of Gain Over Prev. Year
Up to 1925	.....	67,000	.....	67,000	..	219,239	.....	219,239	..	.....	.....	3,413,892	..
1925	14,471,469	140,000	.96	73,000	204	304,397	2.1	85,158	91	4,149,892	28.6	736,000	20.2
1926	15,923,060	388,000	2.7	248,000	239	415,097	2.6	110,000	29	4,993,577	31.3	843,685	14.6
1927	16,056,091	773,000	4.6	385,000	55	528,069	3.3	112,972	2.7	5,769,238	35.3	775,661	-8
1928	19,254,524	1,308,000	6.8	535,000	39	663,069	3.4	135,000	10.6	6,579,122	34.1	809,884	4.5
1929	20,145,774	2,086,000	10.3	778,000	45	815,850	4.0	152,781	13	7,535,122	37.4	956,000	18
1930	20,530,248	2,877,000	14.1	791,000	1.7	995,850	4.8	180,000	18	8,337,122	40.6	802,000	-16
1931	20,356,804	3,783,000	18.6	906,000	14	1,110,850	5.4	115,000	-36	9,149,122	44.9	812,000	1.2
1932	20,054,256	4,581,000	22.8	798,000	-23	1,170,850	5.8	60,000	-47	9,718,952	48.4	569,830	-29.8
1933	20,166,328	5,597,000	27.8	1,016,000	27	1,220,850	6.0	50,000	-16.6	10,718,952	53.1	1,000,000	75.4
1934	20,520,870	6,881,000	33.5	1,284,000	26	1,343,850	6.5	123,000	146	11,840,089	57.7	1,121,137	12.1
1935	21,204,354	8,449,000	39.8	1,568,800	22	1,558,850	7.4	215,000	74	13,068,863	62.1	1,228,774	9.6
1936	22,030,364	10,528,535	47.7	2,079,535	32	1,876,850	8.5	318,000	47.9	14,597,448	66.2	1,528,585	24.3
1937	22,800,000	12,848,535*	56.3*	2,320,000	11	2,281,850*	10.0*	405,000	27.3	16,077,108*	70.5*	1,479,660	-3.2
Estimated Unit Replacement		1,585,335				229,850				3,423,108			
Present estimate of units in use and saturation % after deducting estimated replacements as of Jan. 1, 1938		11,263,200	49.4			2,052,000	9.0			12,654,000	55.5		

\*Not adjusted to replacement sales.

### Zimmerman Says Figures Indicate Great Market Opportunity For Appliances Now

By Paul B. Zimmerman, Vice President in Charge of Sales, Norge Division, Borg-Warner Corp.

THE electrical industry majors in the enrichment of family life. During the past decade it has vaulted spectacularly. Recently, volume in its major product divisions has sluffed off, opening the query as to whether the industry was to suffer a recession, when until now it has shown itself depression-proof; the stellar exception to the parade of business travail that has been endured by other industries in the past eight years.

The electrical industry presents a brilliant record of advancement since 1925, as indicated by the subsequent table. There is superficial reason to presume that such progress will run its course to ultimate stabilization. Many pertinent questions are be-

ing asked by merchants, distributors, and some sales managers of appliance manufacturing concerns. "Saturation is climbing dangerously." . . . "Buying power is towards other desires." . . . "Are we in a tail spin?"

The answer to all is, we are in the most unsaturated market opportunity of all time. We must focus on the constructive sales service to be rendered. Probably the only worry we should have is that of saturation in sales belief and confidence. The need, the want, the desire for electrical appliances is as great as ever . . . but the question is, do we as distributors, dealers, and salesmen believe thoroughly in the forward opportunity?

Analytical diagnosis of the sales outlook in the major electrical appli-

cance markets indicates that the bottom has dropped out of nothing; there is as great an opportunity to sell, within the dimensions that can be negotiated, as ever before.

Since the electrical appliance industries started their acceleration in 1925 and have maintained momentum continuously, it will be interesting to review a few salient facts on this market.

Electric refrigeration in 1925 was an infant, just emerging into its adolescent stride from which it has since sprung to a giant among American industries. In that year, with 14,471,469 wired homes there were 140,000 electric refrigerators in use.

The swift progression of electrical living by the end of 1937 had increased the number of wired homes to 22,800,000, the ownership of electric refrigerators to 12,848,535, a staggering market success but, by no means, one that has exhausted the market.

#### 9,950,000 UNWIRED HOMES

Primary arithmetic will indicate that there was an unsaturated market of 14,330,000 homes in 1925; that there remains, because of the increment of home wiring, a market of 9,950,000 wired homes today that are still unsaturated and lacking the service, economy, and health protection of electric refrigeration. And we dare to say that the selling opportunity is fading?

Further, in this important fraction of the electrical industry market, a replacement factor is now evident that adds to our forward opportunity.

Our national Norge surveys indicate a replacement interest of nearly 2,500,000 units; people who have been accustomed to the service of electric refrigeration and who want the improvements in recent models. This builds a potential market of nearly 12,500,000 refrigerator units; almost as great as the industry market of 13 years ago!

A companionable brightness is shown in the electric range picture, if anything, even more encouraging! Against the inventory of wired homes in 1925, there were 304,000 that were wired for electric cooking. At the beginning of 1938, 2,280,000 ranges were in use, leaving a potential market of 19,520,000; a present saturation of slightly over 10%.

#### UTILITIES COOPERATING

The utility structure is framing its policy towards rapid expansion from the angles that have so far held distributive and dealer merchandising back. Rate structures are being reorganized, installation costs are being lowered, promotional efforts are being intensified and a type of dealer cooperative effort that has been long needed is appearing!

Oldest of the electrical industries, with the exception of the vacuum cleaner, is the electric washer, whose utility has lightened the burden of countless housewives and made American homelife sparkle.

#### THE WASHER MARKET

It has been misinterpreted in relation to present purchasing desire; the distributive factors even nose-diving into "come-ons," "price chiseling," peculiar buying concessions, to stimulate a market which they have erroneously believed was saturated. But it, too, is nearly as large as it has been. Against the wired home inventories for 1925 and now, previously quoted, the ownership of electric washers was then 4,150,000;

leaving an unsaturated market of 14,470,000 units while at the end of 1937 the unsaturated market was 6,725,000 units. The total salability, from the potential market standpoint, is now nearly 50% of what existed in 1925. In addition, there is a replacement factor of nearly 40%, because this appliance has been in use for so many years. So the washer market, like the others noted, is in that re-cycling that gives it a dominant sales expansion opportunity.

Thinking straight, from the distributive standpoint, we have under discussion three types of electrical appliances: (1) The electric range, now at the threshold of sales expansion, (2) The electric refrigerator, well grooved in the sweep of its sales expansion, and (3) The electric washer, long a utility whose market is being reborn.

#### THINK OF 'UNSATURATION'

There is no such thing as saturation, although negatively we like at times, in the marketing field, to use it as an excuse for the failure to produce the sales volume which is deserving of such important electrical appliances. My feeling is, if we really wanted to get in and pitch, we would think of the unsaturation of each appliance market. We are facing our peak volume opportunity, and we should not for a moment tolerate the presumption that it has passed, or that it is behind.

Look at the sales outlook constructively, from the angle of buying intent. No one can ignore the opinions of nearly 30,000 homemakers.

In the Norge survey they declared a buying desire of 30.5% for refrigerators; 11.8% for electric ranges; 24.7% for washers. Projected against national consumers, nearly seven of each 10 families want one or more of these appliances.

#### Cuddeback Named Dealer For Delco-Frigidaire

DETROIT—H. C. Cuddeback has recently been appointed an installing and servicing dealer of Delco-Frigidaire heating and air-conditioning equipment in this territory. The company, located at 4584 Maybury Grand, offers a yearly service contract to Delco-Frigidaire users.



**Anaconda Copper Refrigeration Tubes**

Unusually long lengths!

THE AMERICAN BRASS CO.  
FRENCH SMALL TUBE BRANCH  
General Offices, Waterbury, Conn.



**"AND IT'S A RUSH JOB!"**

When you start on a big installation and it's tagged "rush," you'll find Virginia Service really counts. When you order that extra supply of refrigerant—V-Meth-L, Extra Dry Esotoo, or Methylene Chloride—you can be sure you'll get it—on time. And you'll know that every cylinder-full is backed by long-time experience in refrigerant production, assuring you of a pure, uniform product.

This combination of Service and Quality means customer satisfaction and more money for you.

#### V-METH-L

#### EXTRA DRY ESOTOO

#### METHYLENE CHLORIDE

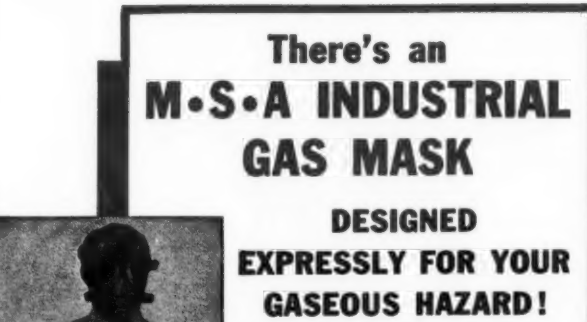
**VIRGINIA SMELTING CO.**  
WEST NORFOLK, VIRGINIA



**Dayton V-BELTS**

Strong, vibrationless, dependable, long-lasting. Powerful grip prevents slippage. A nearby distributor carries a complete stock for appliances and machines.

THE DAYTON RUBBER MFG. CO., DAYTON, OHIO  
World's Largest Manufacturer of V-Belts



**There's an M.S.A. INDUSTRIAL GAS MASK**

DESIGNED EXPRESSLY FOR YOUR GASEOUS HAZARD!

M.S.A. Industrial Gas Masks provide complete protection against ammonia, methyl chloride and sulphur dioxide—using the smallest size canisters that pass U. S. Bureau of Mines requirements . . . the smallest size that insures safety in high emergency concentrations. • Investigate these considerations—they're more important than price. Check into wearing comfort and durability, too. You'll find—as the majority of mask users have—that an M.S.A. Industrial Gas Mask is your best buy. Let us prove it with an actual demonstration.

**MINE SAFETY APPLIANCES COMPANY**  
Braddock, Thomas and Meade Streets, Pittsburgh, Pa.  
District Representatives in Principal Cities



# Service Methods

## Settling of Wax In Valves and Coils May Be Prevented By Using a Good Oil and an Oil Separator

Refrigeration & Air Conditioning Institute  
2150 Lawrence Ave.  
Chicago, Ill.

Editor:

I was very much interested in the article on "Oils" by A. F. Brewer of Texas Co., published in your June 22 issue. The article is very interesting and very enlightening. However, the author does not touch on the subject of wax in oils.

Having encountered trouble with wax settling out in the presence of methyl chloride under low temperature conditions, such as are encountered in ice cream cabinet work, it would be very interesting to hear what Mr. Brewer has to say about this phase of refrigerating oil. Also, I believe it would be of interest to all service men and manufacturers of methyl chloride equipment.

W. H. ALLEN,  
Laboratory Engineer

Editor's Note: Mr. Allen's letter was forwarded to Mr. Brewer, author of the article, who made the following reply:

"At this time, it is rather difficult for me to prepare a definite reply bearing on the subject of wax. As you of course know, practically all petroleum oils contain wax to a varying degree. The extent to which this will be congealed when subjected to cold will depend on two factors:

"1. The temperature.

"2. The solubility of the wax in the refrigerant employed at the temperatures involved.

"Naturally, The Texas Co. has incorporated an investigation of this problem along with our other research pertinent to refrigeration in full realization of the possibility of wax deposits becoming detrimental in refrigerating systems which may have to function continually at sub-zero temperatures. As yet, however, there is not sufficient data accumulated which I can make known.

"Meanwhile, I want to express our own interest in F. B. Riley's article titled 'How Oil Separators Function To Improve Efficiency of Refrigerating Systems,' which appeared in the June 8 issue of AIR CONDITIONING & REFRIGERATION NEWS.

"It would seem to me that the oil separator would be a very logical solution to this problem of wax deposition."

### ANSUL'S EXPERIMENTS

The Ansul Chemical Co. in its research laboratory at the Marinette, Wis. plant has been conducting experimental work on the subject of the separation of wax from oil-refrigerant mixtures, and recently reported the following:

"A continuation of the machine tests shows that the wax which separates from an oil-methyl chloride mixture is capable of producing erratic operation of the expansion valve and, in extreme cases, may cause the valve to cease functioning altogether so that little or no refrigerant passes through it.

"In these tests, approximately 10% oil circulated with the refrigerant. Valve temperatures were approximately -25° F. and the time required to produce erratic operation of, and/or 'freeze' the valve with wax varied from a few hours to two or three days.

"Every effort was made to exclude moisture. There was no evidence of ice crystals in the deposited wax.

"The wax separated throughout the body of the expansion valve and the forepart of the expansion coil. It adhered firmly to the metal of the valve and the coil. A wax deposit, approximately 1/8 inch in thickness, formed on the plate carrying the ball-valve closure.

### EFFECT ON VALVE

"The outlet of the expansion valve in one of the tests was almost completely closed by the deposited wax. In order to measure the amount of wax in valve and coil, each was washed with ether and the ether-washing separately evaporated to recover the wax.

"The wax removed from the valve and from the coil was found to melt a little above room temperature, and to have the consistency of a very stiff grease at the operating temperature of the expansion valve. It is white in color and in appearance quite similar to a low-melting paraffin.

"Erratic behavior and 'freezing' of expansion valves was produced repeatedly in these tests, simply by operating the valves at approximately -25° F. for a relatively short period of time, indicating that trouble from wax separation may be expected in many cases when the temperature of the expansion valve is sufficiently low and the quantity of oil circulating with the refrigerant sufficiently high.

"It seems fairly obvious that many cases of 'frozen' valves, which have been blamed on moisture, may have been due to wax.

"The remedies for wax trouble at expansion valves and in expansion coils are:

"1. Use an oil which separates little or no wax from its mixture with the refrigerant at the operating temperature of the valve, and/or.

"2. Cut down the amount of oil (and consequently wax) circulating with the refrigerant, by the installation of an oil trap."

**LINDERME**  
SEAMLESS TUBING  
Sealed  
AND  
Dehydrated  
**LINDERME**  
TUBE COMPANY  
CLEVELAND, OHIO, U.S.A.

**You NEED This!**

This handy chart instantly shows the HEAD pressure—for ANY suction pressure at ANY room temperature for all air cooled installations using Sulphur Dioxide SO<sub>2</sub>, Methyl Chloride or Freon F-12. Don't guess about head pressures—secure this chart immediately. Price \$1.25. Send Check or Money Order.

**R. W. Cook** Box 176 Columbus, Ohio

**THE COOK**  
HEAD PRESSURE  
CHART  
FOR ANY SUCTION PRESSURE  
AT ANY ROOM TEMPERATURE  
FOR ALL AIR COOLED INSTALLATIONS  
USING SULPHUR DIOXIDE SO<sub>2</sub>, METHYL CHLORIDE  
OR FREON F-12.  
PRICE \$1.25  
Copyright 1938  
By R. W. COOK  
Columbus, Ohio

## Chart Indicates Right Head Pressures

COLUMBUS, Ohio — A handy, pocket-size high-low temperature pressure indicator for refrigeration service men, said to indicate head pressure on any low-side pressure and any room temperature on air-cooled installations using sulphur dioxide, methyl chloride, or Freon-12, has been designed by R. W. Cook here.

The indicator consists of two heavy celluloid discs, riveted together in the center so that they may rotate independently, and marked so that the service man can determine from suction gauge and room temperature readings what the head pressure should be. Large disc is 3 inches in diameter.

With the new form of chart-indicator, it is claimed, the service man also can determine if the trouble is caused by too much liquid, dirty condenser, air in the system, compressor inefficiency, or some other reason.

Providing for the first time a ready answer to the service engineer's most frequent question, "Is the head pressure right?", Mr. Cook's new indicator is said to put an end to the inability to diagnose trouble with the head pressure gauge.

### Garrett Heads Montfort Sales

RALEIGH, N. C.—R. E. Garrett of Richmond, Va. has been appointed sales manager of Montfort Plumbing & Heating Co. here.

## They Prefer Servicing To Selling Jobs



Milo Howard at the workbench in his refrigeration service shop.

MONTGOMERY, Ala.—Installation and service end of the commercial refrigeration business is the specialty of Electric Refrigeration Service Co. of 21 North Lawrence St. here.

"We'd rather let others do the selling of air-conditioning and refrigeration equipment, and be specialists in service," explained Milo Howard, who, with Bruce G. Allen, operates the concern.

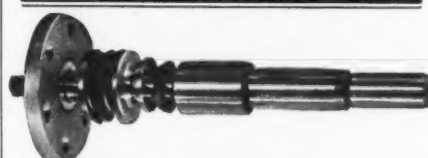
"Since we are not in the selling business directly, other dealers call on us to make installations for them, over quite a territory. The job of

servicing air-conditioning motors and compressors is growing larger all the time."

Among installations recently made by this concern was one for the ice company at Luverne, Ala. This ice plant has locker storage where farmers may bring their meat for cold storage. These lockers must function without interference or delay. Another installation was one recently made for the Lifsey Dry Cleaning Co. of Montgomery, to be used for fur cold storage.

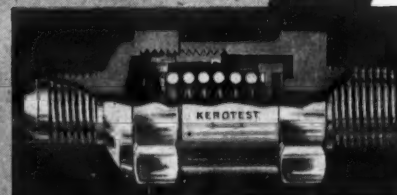
The company's shop is equipped with a bake oven, where a compressor or other equipment may be placed and baked for 24 hours in a vacuum. Motors and other parts are washed in mineral spirits of tetrachloride for thorough cleaning. Other equipment includes valve grinding machines and gauges to test expansion valves. A paint room was recently installed.

Mr. Allen is a graduate of both Frigidaire and Kelvinator schools, and Mr. Howard is an engineering graduate of Alabama Polytechnic Institute, where he majored in refrigeration. They have been in business six years.

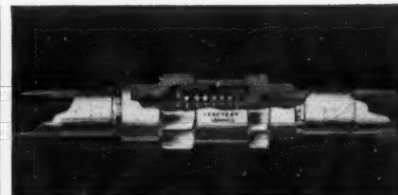


**CHICAGO SEALS.** For general replacements. Triple protection. Work perfectly on scored or bent shafts. Ask your jobber. Write for literature. Only one testimonial needed—Chicago Seal Superiority  
**CHICAGO SEAL CO.**  
9 S. CLINTON ST., CHICAGO, ILL.

**KEROTEST**  
PRODUCTS THAT SPELL  
SAFETY  
IN MODERN  
REFRIGERATION

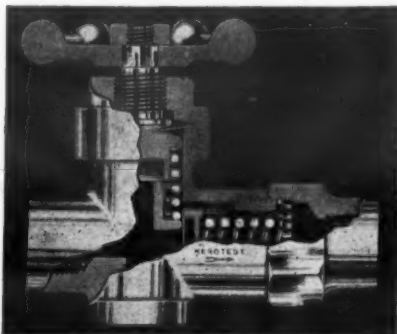


Kerotest Straight-Through Automatic Relief Valves Types 40 and 40-S. For insertion in a line connecting directly to the atmosphere.

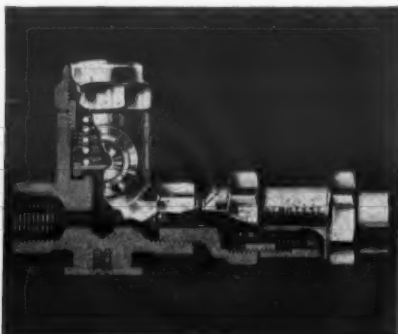


Kerotest Safety Relief Valve Type 41. For small service drums. Endorsed by leading refrigerant manufacturers.

Kerotest Small Safety Relief Valve Type 36. For Liquid Receivers. Release directly to the atmosphere.



Kerotest Combination Manual and Automatic Pressure Relief Valve Type 787 and 788.



Kerotest "High Side to Low Side to Atmosphere" Pressure Relief Valve Type 679.

These Valves are approved for use under many municipal safety codes.



**KEROTEST MANUFACTURING CO., Pittsburgh, Pa.**

The hazards of handling liquids and gases under high pressure conditions in the refrigeration industry have been definitely eliminated through the development of the Kerotest line of Automatic Pressure Relief Valves.

This is a natural development since Kerotest engineers matriculated in the technique of safe gas control away back in 1914 when they were faced with the necessity of designing valves for their own use in what was then considered, the largest commercial welding shop in the world.

As a result, nearly a quarter of a century of progressive development is behind the design of the Kerotest line of Automatic Relief Valves, truly the ultimate in safety and dependability. To maximum safety has been added maximum economy, since these valves are also designed to prevent undue loss of valuable refrigerants.

Like trusted sentinels they stand a day and night watch on dangerous pressures—automatic safeguards that are approved by municipal safety code authorities throughout the country.

Warehouse stocks of Kerotest products are readily available through Kerotest Jobbers in every important industrial center.



## Service

### Properly Planned Service Setup and Policy Will Prevent Headaches For Air-Conditioning Dealers

By P. J. Zilles, Air-Conditioning Service Supervisor  
Westinghouse Electric & Mfg. Co.

ANY thoughtful and candid review of the selling of air conditioning will reveal the very real and pressing need for an adequate and business-like solution of the vital problem of service.

If air conditioning is to continue its spectacular development, if prospective buyers are to have confidence in air conditioning and its suppliers, this problem must be solved immediately! If the vital function of service is to be an asset to the engineering contractor, instead of a liability, the time has come to organize on a thorough and comprehensive basis.

The Westinghouse air-conditioning service department has recognized this need. It has discovered after careful study, that with many engineering contractors, service is a real and annoying problem. With others, it is no problem at all. What is the reason? The answer is organization.

The suggested service setup outlined in detail in this article is based

upon a careful analysis of the successful systems. The best features of several such plans have been incorporated, with additions of our own, into an organized plan.

The plan which we propose provides a method by which service can become self sustaining, if not profitable. This is accomplished by a delineation of the functions, responsibilities, and requirements of the type of service which will create satisfaction for the owner, and new business from the good things he will naturally say to others about your company.

The plan provides for three essentials of an adequate service plan:

- (1) A definite service contract providing for periodic inspection and adjustment.
- (2) A complete installation record.
- (3) A full report of each service call.

The suggested service contract shown could well be termed "Owner

Satisfaction Insurance." The value of such a clearly understandable and understood service arrangement is obvious in the protection it affords to the owner's investment.

And the extra dividends in satisfaction will be returned to you many fold by enthusiastic endorsement of the system.

For this contract covers, at nominal charge, all of the vital functions which must be performed to assure the system's continued efficient operation, and to prevent costly repairs resulting from neglect.

#### A LITTLE MONEY SAVES A LOT

The small cost of this service to the owner saves him much money every year the system is in operation. Operating efficiency stays at a high point, and that cuts costs. There are no annoying and expensive interruptions of service. And the prevention of just one major repair job will save enough to pay for years of service.

The contract calls for inspection and adjustment service at regular stated intervals. This is important. Calls should be made on the same day or days of each month. This regular attention to the needs of the equipment is the element which makes for efficient performance, and which corrects little troubles before they become big ones.

#### OWNER RECEIVES REPORT

The service contract calls for a written report to be sent to the owner after each call. On this report, the exact condition of the system is given. If any repairs are necessary, they are covered on the report. The owner knows, at all times, just how his system is operating.

#### EMERGENCY CALLS PROVIDED

Provision is made in the contract for a reasonable maximum number of emergency service calls during each month the contract is in effect.

The contract calls for the additional important function of seasonal service. Before each season, the system is thoroughly inspected, cleaned, and prepared for action.

Because of the wide range of sizes, operating conditions, and costs,

### Form For the 'Installation Record'

(To be made by the service man for his own reference files, so that he may be prepared when call for service is made.)

Customer..... Job No.....  
Address..... Completed..... 19..  
Space Conditioned..... System.....

#### LOAD ESTIMATE DATA

Outside .....°F. DB .....°F. WB .....°F. DB .....°F. WB  
Outside air .....c.f.m. Recirculated Air .....c.f.m.  
People..... Watts lights..... Other heat.....B.t.u.  
Est. cooling..... B.t.u. sensible..... B.t.u. latent..... B.t.u. total  
Est. heating..... B.t.u. with outside temperature of..... °F. D.B.....

#### COMPRESSORS—CONDENSING UNITS

No.	Type	Style	Serial	Starter S. No.	Heater S. No.	Fuses
No. 1						
No. 2						
No. 3						
No. 4						
No. 5						

CONDENSER—Identify following equipment as to make, type, style, or size.

Water cooled—with compressors..... Other.....  
Evaporative condenser .....  
Water pump .....  
Pump motor .....Type starter.....Fuses.....Amps.  
Fan motor .....Type starter.....Fuses.....Amps.  
Motor pulley....."diameter Fan pulley....."diameter Belt(s).....Size.....

#### AIR-CONDITIONING EQUIPMENT—

Identify following equipment as to make, type, style, or size.

Complete unit(s) .....  
Fan .....Type starter.....Fuses.....Amps.  
Fan motor .....Type starter.....Fuses.....Amps.  
Motor pulley....."diameter Fan pulley....."diameter Belt(s).....Size.....  
Evaporator coil.....Expansion valves.....  
Evaporator coil.....Expansion valves.....  
Evaporator coil.....Expansion valves.....  
Heating coil .....Traps.....  
Filters: No. ....Make.....Size.....  
Other .....

#### CONTROLS—Identify as to make, type, and size.

.....

there can be no universal system recommended for pricing the service. The best method is to evaluate the work to be done in terms of direct labor cost, adding such factors as traveling expense and overhead.

It is true that a small system may cost as much to service as a large one, so the cost of service must be compensated somewhat in line with the amount of the original investment. There is nothing unreasonable about this plan. Every doctor sells

his services on a compensating charge arrangement. Besides, protection of the large investment in the large system is worth more—and reasonable at any fair cost.

The owner will be far more interested.

(Concluded on Page 15, Column 3)

### Service Contract

This contract is made in duplicate this ..... day of ..... 19.... between ..... (Buyer)

and ..... (Seller)

to confirm the conditions and agreements for rendering service to the air-conditioning system (units) described and located as follows:

Description .....  
Location .....  
In consideration of the payment of ..... \$ ..... payable .....

#### The Seller Agrees:

1. To inspect each ..... days approximately for a period of ..... months all mechanical equipments used in the system to determine that they are operating correctly and are in good mechanical repair.

2. To make minor adjustments as required where not more than ..... hours labor and/or \$..... worth material are required, at no additional charge to the buyer.

3. To promptly notify the buyer of conditions necessitating major repairs, replacements, and service, and arrange to correct these conditions by a separate order at current labor and material prices.

4. To respond to calls for service between regular inspection periods, making minor adjustments at no extra charge if conditions necessitate same or major repairs at an agreed price.

#### The Buyer Agrees:

1. To accept the judgment of the Seller as final as to the means and methods employed for any corrective work considered.

2. To report immediately any condition which may indicate the need of correction before the next regular inspection.

3. To grant free access to all equipment during working hours so that the Seller may complete his inspections.

#### It Is Further Agreed:

1. That the Seller shall not be responsible for failure to render service when prevented from so doing by conditions beyond his control.

2. This contract is subject to cancellation by either party upon ..... days' notice in writing.

Signed ..... (Buyer)

By ..... (Seller)

By .....

Quick to install, easy to service, economical to operate—that's Coltrol D-X beverage cooler.

**COLTROL**  
Write for literature Commercial Coil & Refrig. Co.  
457 N. Artesian Ave., Chicago

**ALCO** Engineered Refrigerant Controls  
—For Highest Evaporator Efficiency  
Alco Valve Co. St. Louis, Mo.

## BUNDY TUBING



... resists vibration fatigue

BUNDY TUBING CO.  
DETROIT

### Form For the 'Service Record'

(On reverse side of 'Installation Record' Sheet.  
For a permanent service record on each installation.)

Service Contract No. .... Signed ..... 19.... Effective.....  
to..... 19.... Renewed.....

#### SERVICE CALLS

Date	Service Man	Work Done
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....



convenient  
to use in any position...



Overhead soldering is easy with the light Prest-O-Lite Torches.

Prest-O-Lite Gas for Prest-O-Lite Torches can be obtained at any of the thousands of Prest-O-Lite Gas Exchange Service Stations.

WITH the slender, gooseneck-type tip and high-temperature air-acetylene flame of Prest-O-Lite Torches, you can apply heat exactly where you want it. These modern torches, for soldering, heating and light brazing, provide an efficient and exactly controlled flame in whatever position they are held. They will save both time and money.

Telephone your jobber, or write to us for a demonstration of Prest-O-Lite Torches.

A-6107 Prest-O-Lite Torch (illustrated)

Price ..... \$2.50

The word "Prest-O-Lite" used herein is a registered trade-mark.

THE LINDE AIR PRODUCTS COMPANY  
Unit of Union Carbide and Carbon Corporation

New York and Principal Cities  
In Canada: Dominion Oxygen Co., Limited, Toronto



**L. H. GILMER COMPANY**  
**Tacony, Philadelphia**



## Distributor-Dealer Doings

### Southern Equipment Co. of San Antonio Moves Quarters To 3-Story Building

SAN ANTONIO, Tex.—The Southern Equipment Co. of this city, wholesaler of automotive, radio, and electrical supplies and appliances, has moved into a three-story building near South St. Marys and Villita Sts.

In its new location, the company will have an increased floor space of approximately 25%, will have

show and display rooms, as well as offices, on the first floor, and will be in a much better position to serve the trade. Business has already shown a marked improvement because of the accessibility.

Southern Equipment Co. is distributor in San Antonio and southwest Texas for Kelvinator household appliances.

### Frigidaire Dealers Hold Memphis 'Clinic'

MEMPHIS, Tenn.—More than 250 Frigidaire dealers and salesmen of the Memphis territory were guests of McGregor's, Inc., distributor, at a mid-summer sales and merchandising clinic recently at the Peabody hotel here.

John M. McGregor, president of the distributing firm, conducted the meeting and was assisted by Joe Rushton, Dayton, sales manager of the Frigidaire range division of General Motors Sales Corp., and R. H. Huston, Memphis, zone manager.

A similar meeting was conducted by McGregor's, Inc., July 1 at Little Rock, Ark., for dealers and salesmen.

### Sold Nearly 100 Units In Month



These men sold 96 refrigerators in 30 days. Top row (left to right): Dalton S. Clarke, Troy Slindard, Lee Dammon, Fred Hein. Bottom row: William Dawson, Jack Banko, Ed Kahler, and Lawrence Ring.

### Wesco Moves Atlanta Office To New Building

ATLANTA—Westinghouse Electric Supply Co., Georgia distributor for Westinghouse Electric & Mfg. Co., has moved its offices into a new four-story building on Peachtree St. here.

Officially to open the new quarters, the company was host to 400 dealers at a buffet supper and inspection tour.

First floor of the building is devoted to display, featuring an all-electric kitchen available for the use of dealers and builders. Second floor houses the offices, and the remainder of the building provides warehouse and distribution facilities.

L. E. Felt is manager of the division, and R. L. Boyd is merchandise sales manager.

### Madison, Wis. Dealer Hangs Up Record

MADISON, Wis.—Sales staff of Every-House Appliance Co., Westinghouse dealer at 114 E. Main St., recently won recognition from Westinghouse's national sales department for selling 96 electric refrigerators during a 30-day sales contest.

Members of the sales staff of the dealership are: Jack P. Banco, Dalton S. Clarke, Lee Damon, William Dawson, Fred Hein, Ed Kahler, Lawrence Ring, and Troy Slindard.

### 17 New Distributors Added By Detrola

DETROIT—Addition of 17 new firms to the list of Detrola radio distributorships has been announced by James J. Davin, Detrola vice president in charge of sales.

The new distributors are:

Brown Supply Co., St. Louis; Jones-Cornett Electric Co., Welch, W. Va.; Polk Musical Supply Co., Atlanta; Southwestern Music Corp., Dallas, Tex.; E. E. Forbes & Sons Piano Co., Birmingham, Ala.; Kelley-How-Thompson Co., Duluth, Minn.; and Billings, Mont.; Radio Television Co., Phoenix, Ariz.; Oakley Electric Co., Boise, Idaho.

Wilson Music Co., Oshkosh, Wis.; 555, Inc., Little Rock, Ark.; W. B. Davis Electric Co., Memphis, Tenn.; Williams & Shelton Co., Inc., Charlotte, N. C.; Piedmont Distributors, Inc., Greensboro, N. C.; W. S. Donan Hardware Co., Richmond, Va.; Radio Supply Co., Norfolk, Va.; True & Blanchard, Newport, Vt.; and R. B. Wall Co., Wilkes-Barre, Pa.

### Charleston, W. Va. Dealers Show Cooling Equipment

CHARLESTON, W. Va.—Mechanical refrigeration and air conditioning were prominently featured at the Charleston Home Show, held at the WCHS Auditorium July 11-14 under the auspices of the Charleston Gazette.

Appalachian Electric Power Co. and Charleston Electrical Supply Co. displayed electric refrigeration, while Electrolux refrigerators were presented by United Fuel Gas Co. and West Virginia Heating & Plumbing Co. Carrier air conditioning was featured by Rosenblatt & Hunt.

### Cahn To Retail Norge In Shreveport, La.

SHREVEPORT, La.—Cahn Electric Co., 708 Milam St., has been appointed retail dealer for Norge refrigerators and home appliances in the Shreveport area. R. S. Christy has been appointed appliance department manager for the company.

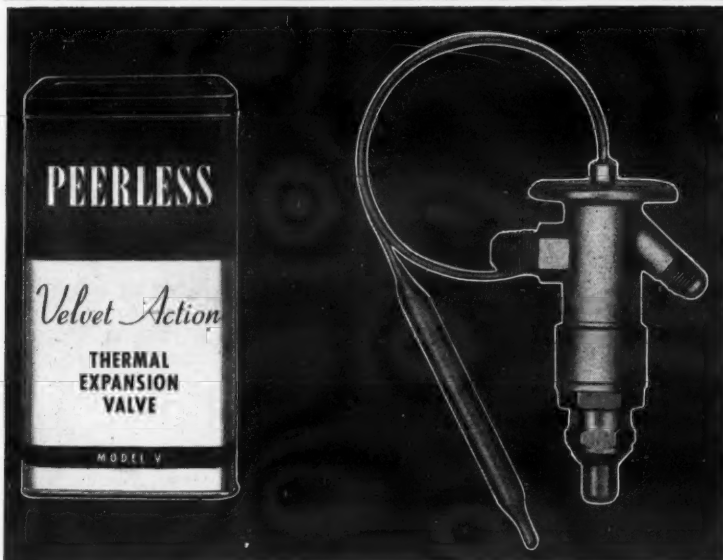
### Bowen Electric Is Norge Dealer In Augusta, Ga.

AUGUSTA, Ga.—Bowen Electric Co. has been named Norge dealer in this territory by officials of Norge-Nestor Co., Inc., distributor in South Carolina. A. L. Bowen is president of the dealership, which also handles Westinghouse and Graybar ranges and hot water heaters and Freshen'd-Air ventilating equipment.

### Crawford Leaves Post With Chicago Wesco

CHICAGO—C. A. Crawford, five-time "Quota-Buster" salesman in the apartment house division of the Chicago branch of Westinghouse Electric Supply Co., has resigned this position to become manager of the South Side office of First Realty Co., real estate management firm here.

## THE BUYER'S GUIDE



### The Valve Sensation of the Year— THE NEW PEERLESS MODEL V THERMAL EXPANSION VALVE

It's the only "Velvet Action" valve on the market—and the only valve that is Safety Sealed in a Tamper-Proof Metal Container for your protection.

**BUY THIS NEW VALVE FROM  
YOUR LOCAL PEERLESS JOBBER**

### PEERLESS of AMERICA, Inc.

Established In 1912 As The Peerless Ice Machine Co.

Main Factory—General Offices  
515 West 35th Street

New York Factory Chicago Pacific Coast Factory  
43-20 34th Street 3000 S. Main Street  
Long Island City Los Angeles

**BUY PEERLESS FOR PERFORMANCE**

## LEADERSHIP

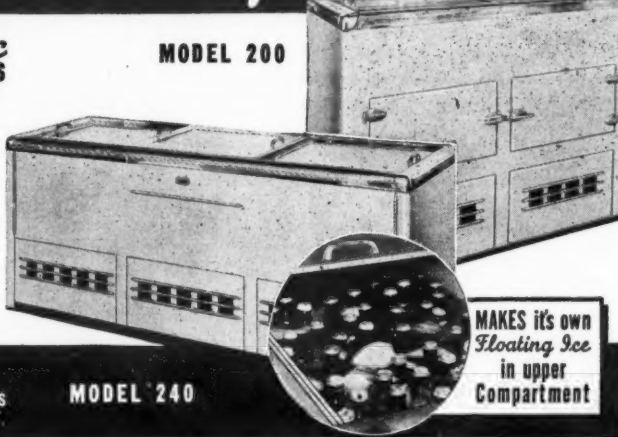
## Won by MERIT



### PELCO Electric BEVERAGE & BEVERAGE-FOOD COOLERS

The world's largest builder of "floating ice" beverage and beverage-food coolers! And, no wonder! PELCO chills from room temperature to desired degree in about 30 minutes—makes its own floating ice automatically as needed. It's an EXTRA value cooler—lower refrigerator compartment makes PELCO doubly useful... extra quality... extra performance... extra beauty... extra years of service. Super-powered. CASH IN on PELCO—GET ALL the FACTS.

Address Desk A-78



MODEL 200

MAKES its own  
Floating Ice  
in upper  
Compartment

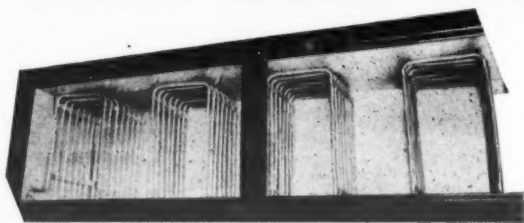
### Refrigeration Division

PORTABLE ELEVATOR MFG. CO., Bloomington, Illinois  
In Canada UNIVERSAL COOLER CO. of CANADA, LTD. BRANTFORD, ONT.

MODEL 240

## THE IDEAL SPEED COOLER

Tremendous  
Capacity  
Unbelievable  
Fast Cooling  
Compartments



Can be used  
For Wet or Dry  
Storage

### CONTROL THE BEVERAGE COOLER MARKET IN YOUR TERRITORY

The beverage cooler your customers will invariably prefer. It is a proven fact that in any territory where the Ideal Speed Cooler is in operation, all competition is eliminated.

**WHY?** Enormous capacity, unbelievable fast cooling, satisfying the most exacting demands. Compartment coil feature eliminates "hunting" or "wading" for the right brand.

Sturdy in construction, beautiful in appearance. Two models, six sizes.

**CASH IN** on the beverage cooler sensation of the year. Some territories still available.

**IDEAL BEER COOLER CO.** 1500 No. Broadway, St. Louis, Mo.  
Manufacturers of all kinds of Liquid Coolers

## Built for Business—RANCO Replacement Refrigerator Controls!

**STURDY**, accurate, attractive! See the complete line of good-looking, long-wearing Domestic Refrigerator Controls featured by your Ranco jobber. Forty-two models—built for business in every sense of the word—to save your time and to please your customers.

Ranco offers 32 Exact Replacements—ready for quick installation. No cutting. No fitting. Simply "toss out the old—slip in the new"! More than 200 of America's liveliest jobbers sell and recommend Ranco Replacement Controls.

**Ranco INC.,**  
Columbus, Ohio, USA



### AIR CONDITIONING •

### FITTINGS

### REFRIGERATION •

We manufacture an exceptionally complete line of Valves, Fittings and Accessories for Mechanical Refrigeration and Air Conditioning.

Send for our new Catalog and Price List 2004—The most comprehensive catalog ever issued to the trade.

**MUELLER BRASS CO.**  
PORT HURON, MICHIGAN



# Major Appliances

## Exclusive Range Show Held In Cleveland; 43 Models Shown

CLEVELAND — First exclusive showing of modern electric ranges in Greater Cleveland was held here recently in the auditorium of the Electrical League of Cleveland, with 43 different models of ranges on display.

League-trained homemaking advisors demonstrated the ranges for visitors, and meals cooked on demonstration ranges featured the showing. A complete electric kitchen was displayed to show the economy of a planned time-and-energy-saving kitchen appliance ensemble, and to emphasize the ease with which modern electrical equipment can be used to remodel old-fashioned kitchens.

**For Information on Motors FOR ALL TYPES OF Air Conditioning and Refrigeration Equipment WRITE TO**

**Wagner Electric Corporation**  
311 KENTWOOD AVE. ST. LOUIS, MO.

**You Can Install SPORLAN THERMOSTATIC VALVES with Confidence!**

**BRUNNER**

Send for the New REFRIGERATION CATALOG

Seven Models of Compressors  
Fifty-eight Models of High-sides from 1/4 H.P. to 15 H.P.

**BRUNNER MANUFACTURING CO.**  
UTICA, N. Y.

## MASTERCRAFT

ADJUSTABLE PAD AND CARRYING HARNESS

The most efficient and economical equipment made for handling refrigerators safely and without scratching or marring. Pad is separate from harness and both adjustable to all styles and sizes of cabinets. Efficient, sturdy, easily and quickly applied. Name of refrigerator attractively lettered on pad without charge.

Adjustable Pad, \$9.50 each  
Adjustable Harness \$6.00 each f.o.b. Chicago.

Write for 1938 folder and prices on pads for refrigerators, washers, ironers, ranges, radios, etc.

Pat. Appl'd for

**BEARSE MANUFACTURING CO.**  
3815-3825 Cortland Street, Chicago, Illinois

**The Preferred Refrigerant for service work**

**Artic**  
(DU PONT METHYL CHLORIDE)

MACHINE MAKERS like ARTIC because its favorable combination of properties permits building compact, light-weight units that operate efficiently and economically.

Service Men like ARTIC because its high purity, wide distribution and ease of handling contribute to convenient, dependable work in recharging Methyl units.

**DU PONT**

E. I. du Pont de Nemours & Co., Inc.  
THE R. & H. CHEMICALS DEPT.,  
Wilmington, Del.

## Government's Study Reveals Trends In Sales of Washers

WASHINGTON, D. C.—Washing machines were found to predominate among electrical appliances designed to save household labor in a study of families in 140 American villages selected as representative and announced this week by the Bureau of Home Economics of the United States Department of Agriculture.

The report revealed that more families in these villages owned sewing machines than washing machines, but far more of the washing machines were motor driven. Vacuum cleaners were runners-up on washing machines, while ironers were seldom found.

"Perhaps the most significant fact shown by this study is that, aside from the Southeast which differs strikingly from the rest of the country due to the plentiful supply of Negro help, one-half to three-fourths of all families interviewed owned motor-driven washing machines," declared Dr. Louise Stanley, chief of the Bureau of Home Economics and director of the study.

"It is to be remembered that the non-owners included the families wealthy enough to hire all laundry work done as well as those in which the homemaker was not yet emancipated from the drudgery of the washboard and tub. It is thus not too much to say that lightening the laundry work is one of the first considerations in purchasing the more expensive pieces of equipment.

### BY GEOGRAPHICAL AREAS

The percentage of ownership of washing machines was highest in the North Central and Middle Atlantic villages. Of 3,042 families studied in 46 villages in Pennsylvania, Ohio, Michigan, Wisconsin, Illinois, and Iowa, 81% owned washing machines. Of these, 76% were motor-driven machines and 6% other types, with a few families owning both types.

In 24 villages in California, Oregon, and Washington, 77% of the 1,471 families studied owned machines, 74% of which were motor driven and 3% other types.

In the Southeast, 2,100 white families in 33 villages in North Carolina, South Carolina, Georgia, and Mississippi were interviewed. Of these, only 2% owned washing machines, nearly all of which were motor driven. Of 972 Negro families in these villages, only three-tenths of 1% owned washing machines, about one third of which were motor driven.

### IRONER SURVEY

Considering both cost and their comparatively recent introduction, ironers made a fair showing, Dr. Stanley declared. In the Pacific villages, 11% of the families studied had ironing machines in their home laundries. This percentage was much lower in other sections, running as follows: Mountain and Plains villages, 5.4%; North Central and Middle Atlantic villages, 5%; New England, 4.2%; white families in the Southeast, 1.4%; and Negro families in the Southeast, 0.3%.

The vacuum cleaner was found to have swept aside the broom in more than half the village homes reporting in three regions. Fifty-nine per cent of the families in the North Central and Middle Atlantic villages owned vacuum cleaners, as did 56% of the New England families, and 53% of the families on the Pacific Coast. In Kansas, South Dakota, North Dakota, Colorado, and Montana, some of which are "dust bowl" states, 45% of the village families were equipped to handle the dust by the suction method.

Only non-relief families having both husband and wife born in this country were included in the study. It was made as a WPA project conducted by the Bureau of Home Economics of the U. S. Department of Agriculture in cooperation with the Bureau of Labor Statistics of the U. S. Department of Labor, the National Resources Committee, and the Central Statistical Board.

## Groping of Engineer Puts G-E Dealers In The Soap Business

BRIDGEPORT, Conn.—Appliance dealers handling General Electric home laundry equipment now also are in the soap business, thanks to the research efforts of David Hays, commercial engineer for G-E's home laundry equipment section here, who followed a laboratory problem to the bottom of the tub and came up with a new scientific washing compound.

Problem was to obtain cleaner, whiter clothes, and the G-E laboratory undertook a study of the chemical reactions taking place during the ordinary cycle of the washing machine. Hard water, as in the past, was the villain of the piece.

Engineers found that the mineral content of the water combined with alkalis in soap to form a metallic soap, or soap curds. These are insoluble. They stick to fabrics, are ironed into them, and result in harsh textures and the graying of white fabrics, no matter how efficient the washing action of the machine may have been.

Even with rain water, Mr. Hays found, the calcium resulting from perspiration adheres to clothes and tends to harden the water and form soap curds. That's why it's usually harder to clean the neckbands and cuffs of shirts, particularly likely to absorb perspiration.

Adding more soap to the washing solution, to create more suds, might be thought a simple solution—but it was found that excess suds gave poorer washing results because they created additional soap curds, which in turn attached themselves to the clothing.

### WHAT TESTS SHOWED

Testing a number of washing compounds available for use with domestic washing machines, engineers found that, while these compounds were effective for washing by hand, because they precipitated the calcium to the bottom of the tub, action of the washing machine element immediately stirred the calcium up and circulated it, forming injurious curds which would stick to clothing.

Formation of soap curds must be prevented, the engineers decided, if results satisfactory to women were to be obtained.

Answer was found in a complex chemical, which acts on calcium in such a way that it cannot combine with soap alkalis. The chemical is neither bleach nor acid, and its only function is to normalize or soften the water. It has no harmful effect on fabrics being washed.

With the chemical as a basis, a new washing compound was created. Extensive tests have been made which are said to have proved that the compound eliminates lime soap curds in the water, resulting in a cleaner, whiter wash, free from the grayness that often is present.

### PURPOSE OF NEW SOAP

Use of the compound, it is felt, will add life to fabrics, since fibers which are free from lime soap curds are softer and more pliant, and hence less likely to break than hardened, brittle fibers.

As a result of his researches with shirt cuffs, diapers, and children's undergarments, instead of the usual gear boxes, lubricants, and motors, Engineer Hays recommended that G-E create and distribute the new washing compound for use with its home laundry equipment.

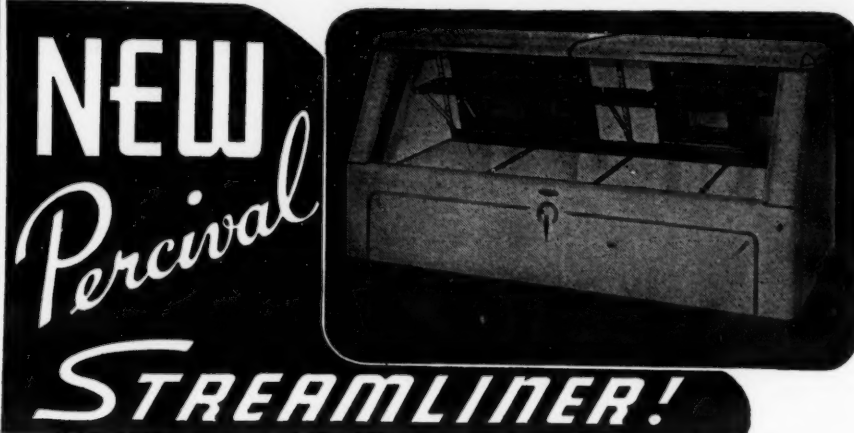
Two types are now being distributed through the company's dealers—one which is applicable where the water does not exceed four grains of hardness, and the other for water up to eight grains of hardness. No other soap is necessary in the washing operation.

## Meyberg Holds Pre-Views For N. Calif. Dealers

SAN FRANCISCO—A pre-market showing of the complete 1939 lines of RCA Victor radios and Victorolas was held recently for the dealer trade by Leo J. Meyberg Co., distributor, in Western Merchandise Mart here.

Somewhat enlarged, the same display will be showed through Fall Market Week, July 25 to 30. The Meyberg company also is Norge distributor in this area.

## THE BUYER'S GUIDE



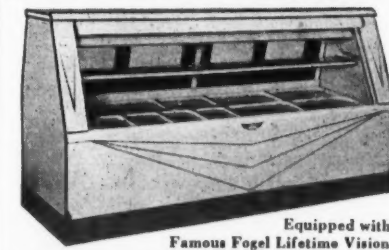
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Write for details of Profit-making franchise. Complete PERCIVAL line meets every requirement of the modern food store.

Modern styling . . . Beautiful design . . . Outstanding construction . . . Economical operation! TOMORROW'S case, presented TODAY! Get the jump on other distributors by selling this modern marvel of electrical refrigeration. Its NEW style and NEW features give you exclusive selling advantages! NEW PERCIVAL FINANCE PLAN HELPS YOU SELL.

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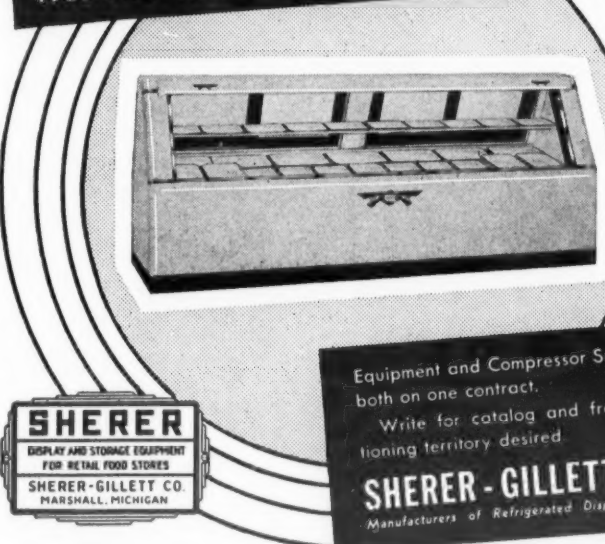
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Inquire today about our full line of refrigerated food storage and display equipment.

Interesting distributor proposition to qualified firms.

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16th & Vine Sts., Phila., Pa.

## DOUBLE PROFITS Selling Sherer's 1938 CASE AND COOLER HEADLINERS



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- ★ COMPLETE LINE OF CASES, COOLERS AND BOXES.
- ★ NEW EQUIPMENT constantly under development, opening new fields for compressor sales.
- ★ LAYOUT DEPARTMENT—layouts for food store modernization programs without obligation.
- ★ ADVERTISING—Sherer Equipment advertised by mail and in leading trade publications.

Equipment and Compressor Sales go together. Sell both on one contract. Write for catalog and franchise details, mentioning territory desired.

**SHERER-GILLET CO. MICHIGAN**  
Manufacturers of Refrigerated Display and Storage Equipment

## Reduce Power Costs Remove Oil and Gum Wax with

## AMINCO Oil Separators (automatic oil return)

To prevent oil seepage to condenser, liquid receiver and evaporator is to reduce power costs.

The Aminco Oil Separator removes oil from refrigerant gases and automatically returns it to the crank case. Gummy residue and gum wax is retained in the separator sump, thus preventing the plugging of expansion valves and expansion coils.

Installation of AMINCO OIL SEPARATORS results in definitely reduced power costs.

Made in 1/2 to 7 1/2 h.p. Capacity. Ask your jobber.

**AMERICAN INJECTOR CO.**  
1481 Fourteenth Avenue, Detroit, Mich.



## Conditioning Cuts Ill Effects of Noise On Industrial Workers, Doctor Says

Industry might well adopt the watchword, "Quiet, please," if it accepts the findings of Dr. Carey P. McCord of Detroit that noise undermines workers' efficiency and reduces production.

Attacking one of medicine's problems in the workshops of the nation, Dr. McCord calls noise the most neglected of all health hazards in industry today. His report on the importance of noise as a cause of industrial illness was made at a recent sectional meeting of American Medical Association in San Francisco, and is a by-product of a special AMA committee's work on air conditioning.

Recognizing that closed windows and doors required by air conditioning lessen the effects of street noises, the report turns to the problem of noise inside factories, finds it responsible not only for occupational deafness among workers, but also for nervous disorders and excessive fatigue among others.

By Carey P. McCord, M.D., Detroit, Michigan

THE American Medical Association's committee to study air conditioning has, during the 18 months of its existence, sought to establish the basic requirements of acceptable air conditioning from the viewpoint of health and comfort. Early this committee recognized that one of the beneficent by-products of suitable air conditioning is to be found in the lessening of the ill effects of certain types of noises, chiefly street noises.

Ill versed in the physics of noise, this committee sought and obtained the guidance of qualified workers in this field. As a result of the investigation made by these advisory associates, the committee has prepared an extensive report related to noise, its ill effect on human beings, methods of measurement and control, all with especial reference to air conditioning as one factor in control measures.

### NOISE NEGLECTED

This present report embraces the outstanding features and popular aspects of investigations sponsored rather than directly achieved by the Association's committee.

In the world of industrial hygiene, noises perhaps constitute the most neglected of the widely prevalent exposures that may affect workers. Under ordinary circumstances, the workman, on leaving his employment, leaves behind him the opportunity for further contact on that day with the injurious substances or conditions that surround him.

Obviously this statement applies

to industry's dusts, gases, and vapors, but in the case of noise, the workman is likely merely to exchange work noises for street noises, or other noises in the community environment. The result is that for many millions of persons, particularly those working and living in urban areas, a more or less continuous influence of noise is exerted.

Noises lead to multiple and insidious ill effects on physical and mental well being, not only for some workers, but also for large numbers of the non-industrial population.

Chief among these evil results from noise is deafness, or hearing impairment. In some noisy industrial employments, it is not unusual, through precise testing, to establish that even among workers below 30 years of age as many as 50% may be hampered by some degree of hearing impairment.

### MANY CONSEQUENCES

Apart from noise deafness, an array of scarcely measurable noise consequences may be recognized, including divers neuroses, evils attending loss of sleep, excessive fatigue, vegetative nervous system disorders, emotional upsets, and the like. These make up a class of dysfunction to which the name "echeoses" may be applied, although warrant for coining special terminology may be open to question.

The physics of sound and its subdivision noise is so complicated as to make difficult any widespread understanding of noise problems and noise control. In order to challenge inter-

est in this statement, two items are here introduced, somewhat inconspicuously.

First, it might be assumed that two identical whistles, sounding together, would make a noise twice as loud as one. Instead, they make a combined sound only three decibels louder than that of one whistle. Thus, if each whistle produces a 75 decibel sound, the two together will produce a sound of 78 decibels. It would take 100 identical whistles to cause a noise 20 decibels louder than that of one whistle sounded alone.

A second example may be found in the fact that small reductions in noise at certain high levels will enormously reduce the loudness sensation. For example, if an initial sound intensity, represented by 100 decibels, is reduced to 90 decibels, the corresponding percentile reduction in loudness sensation is 57%.

At once such matters take on practical importance if the industrialist may be brought to realize that small reductions in sound intensity may bring about most helpful results in connection with worker protection.

While the formal report of this committee on noise presents in some detail many aspects of noise and noise problems, the present situation permits only a synoptic presentation. The following sentences, therefore, are but captions to more nearly adequate discussions.

### NOISE DEFINED

1. Noise is disordered sound, or sound which is considered unmusical, confused, discordant, irksome, or disturbing. Physically, noise is the result of one or many component sound vibrations which bear no harmonic relation to one another, or which occur more or less in rapid succession with irregular intensities.

Harmonic sounds also may have the same unpleasant effect as noise, if their intensities become too great. It should be borne in mind that the distinction between noise and music cannot be made on a strictly physical basis, since individuals differ widely in sensitivity, temperament, and sound appreciation, and therefore will not unanimously agree to an arbitrary differentiation between musical sounds and noise.

2. Sound "intensity" and "loudness" are not synonymous, due to the fact that the ear is not uniformly sensitive throughout the entire range of audible frequencies.

"Intensity" is a physical term used to denote the amount of sound energy passing through a unit area per unit of time. "Loudness," on the other hand, refers to the sensation evoked by a given sound intensity.

Thus the loudness of a sound depends both upon its intensity and upon the physical characteristics of the ear. The ear is sensitive to a range of frequencies from 16 to 22,000 cycles per second, but is most sensitive between 1,000 and 5,000 cycles.

### INTENSITY RATING

3. Noise intensity is expressed as units on the decibel scale, which is a logarithmic scale. The "bel" is the unit and the threshold of audibility or hearing is the zero point on the decibel scale. (Tables 1 and 2.) If the intensity of the sound increases 10 times, its intensity level is said to have risen 1 "bel"; 100 times 2 "bels." A "decibel" is one tenth of a "bel."

4. Sounds may not only be heard, but felt, and when the intensity is such that feeling takes place, the sound is said to exist in the "feeling zone." The threshold of feeling is near 120 decibels for certain sound frequencies. At such a level, sound has an intensity of one trillion (1,000,000,000,000) times its initial value.

5. At very low noise levels, a change of five decibels is barely perceived by the ear, whereas in higher ranges, such as around 60 decibels, so slight a change as .3 of a decibel is readily noticeable. At once it may be stated that noises in the higher decibel range are much more significant in connection with health conservation than low range noises.

### AIR-BORNE VIBRATIONS

6. Air-borne vibrations of the general nature of sound, but not within audible ranges, may exert greater damage to ears than audible sounds. For example, in a drop forge shop, extraordinary sounds are not present, but the frequency of damage to workmen may be expected to be higher than from usual audible sounds, and the injury is likely to appear after shorter periods of ex-

Table 1—Relation of Certain Sounds To Hearing Threshold

Average Decibels	Source or Description of Sound
130	Threshold of painful sounds; limit of ear's endurance
120	Threshold of feeling (varies with frequency)
115	Airplane motor (1,600 r.p.m.) 18 feet from propeller
110	Steel plate hammered by four men—2 feet
105	Express train passing at high speed
100	Loud automobile horn—23 feet
95	Pneumatic drill—10 feet
90	Lion's roar—18 feet
85	Very heavy street traffic along elevated line
80	Street car crossing tracks
80	Police whistle—15 feet
80	Very loud radio music in the home
75	Heavy street traffic
75	Snow scraping and shoveling—15 feet
70	Interior of street car
70	Loud peal of thunder (1 to 3 miles)
65	Usual loudness of radio music in the home
60	Ordinary conversation—3 feet
55	Speech in a small auditorium
50	Conversational voice—12 feet
45	Speech in a large auditorium
45	Near outlet of ventilating duct in high school auditorium (very noisy)
40	Center of New York, quietest time of night
35	Loud fan noise in theater
35	Soft radio music in the home
30	Ticking of watch—3 feet
30	Quiet street; no traffic
20	Whisper—4 feet
15	Quiet fan noise in theater
10	Rustle of leaves in gentle breeze
8	Near outlet of ventilating duct in MGM sound studio (planned control of noise)
0	Threshold of hearing; faintest audible sound

Table 2—Decibel Scale Compared With Subjective Loudness Scale

Identification	Objective (Stimulus Intensity)		Subjective (Sensation Produced)	
	1 Decibels— Logarithmic Scale of Intensity†	2 Arithmetic Scale of Relative Intensity	3 A.S.A.* Proposed Loudness Scale	4 Relative Loud- ness Scale of Churcher, King, Davies‡
Threshold of Feeling (aural)	120 110 100	$10^{12}=1,000,000,000,000$	560,000 220,000 88,000	..... 64,000 40,000
Lion's Roar, 18 feet.....	90 80 70	$10^9=1,000,000,000$	38,000 17,000 8,000	26,000 16,000 8,800
Ordinary Conversation, 3 feet	60 50 40	$10^6=1,000,000$	4,400 2,200 1,000	4,400 2,200 1,000
Tick of Watch, 3 feet.....	30 20 10	$10^3=1,000$ 100 10	360 100 14	400 120 ...
Threshold of Hearing .....	0	$10^0=1$	1	...

\*American Standards Association.

†At 1,000 cycles per second.


‡Figures in this column represent original units multiplied by 400 to facilitate comparison with column 3.

posure. In case of cannon fire, both sound waves and inaudible waves operate to the injury of artillerymen.

7. Noise loudness in industry and elsewhere readily may be measured through comparatively simple devices bearing the general name

"sound level meters." The conventional audiometer may be utilized as a noise meter, as well as a hearing meter. Similarly, tuning forks may be applied for the purpose of quantitation.

(Concluded on Page 19, Column 2)



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WELDED STEEL Refrigerators

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Modern practice in refrigeration and space cooling calls for permanent records—and that means Marsh Recording Instruments. Recording Gauges are available with charts reading for ammonia, Freon and other refrigerants. Recording thermometers are also available for all standard applications. Multiple pen instruments may be used to record either temperature at several points or both pressure and corresponding temperature.

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RATES: Fifty words or less in 6-point light-face type only, one insertion, \$2.00, additional words four cents each. Three consecutive insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

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AVAILABLE, one slightly used, nicely broken in refrigeration and air conditioning engineer. M.E. graduate 1926. One year refrigeration manufacturer engineering department. Three years sales, service, and installation. Three years in refrigeration and air conditioning school. Three years with refrigeration accessories manufacturer in development and sales work. Have written course in refrigeration and air conditioning. Many articles published in three different trade papers. Member A.S.R.E. and R.S.E. While engineers are cheap get a good one. Box 1066, Air Conditioning & Refrigeration News.

### EQUIPMENT WANTED

INTERESTED IN purchasing 500 to 1,000 1/2 and 1/3 H.P. refrigeration motors—new or used repulsion induction or capacitor type. Also interested in purchasing single or twin cylinder late type household compressors. Any quantity. FEDERAL REFRIGERATOR CORP., 57 E. 25th St., New York City.

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WE OFFER for immediate delivery Delco and Leland motors, A.C. 60 cycle, 110-220 volt, 1/2 H.P. capacitor type \$5.00; 1/4 H.P. \$5.75; 1/3 H.P. \$7.50; 1/2 H.P. \$17.25; 1/3 H.P. \$18.50. These are all brand new motors in original cartons. Stock on hand of other cycles and D.C. motors. INTERSTATE REFRIGERATOR CORP., 96 Fifth Ave., New York City.

FOR SALE: New General Electric type C. M. commercial condensing unit complete with controls and 1/2 Hp., 1 phase, 110 volt G. E. motor \$47.50. COMMODORE ELECTRIC CO., 521 N. Wells St., Chicago, Ill.

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DOMESTIC CONTROLS repaired: Ranco pencil \$1.75, Ranco box \$2.00, General Electric \$2.00, Tag \$2.00, Cutler-Hammer \$2.00, Penn \$2.00, Bishop Babcock \$2.50, Majestic \$2.50, Penn magnetic \$2.50, G. E. Frigidaire \$2.50. In business over 20 years. Our name is our guarantee. UNITED SPEEDOMETER REPAIR CO., INC., 496 West 57th Street, New York City.

CONTROL REPAIR service. Your controls repaired by expert mechanics, with special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. HALELECTRIC LABORATORY, 1793 Lakeview Road, Cleveland, Ohio.

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HERMETIC HOUSEHOLD unit with practically all tools and dies for low cost manufacture. Very reasonable on outright or royalty basis. Unit proven in actual service. Reply Box 1067, Air Conditioning & Refrigeration News.

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REVOLUTIONARY ELECTRIC Range Burner with a new sales story for domestic and heavy duty heating appliances ends service problems; housewife replaces burnouts herself. Higher wattages, lower element temperatures. Longest life. Open or closed designs optional. Patent pending. Write Electrical Engineer, Box 1064, Air Conditioning & Refrigeration News.

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HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

## Anaconda Copper Refrigeration Tubes

for difficult jobs!



## Air Conditioning Aids Noise Abatement

(Concluded from Page 18, Column 5)

8. Noises at or above 90 decibels are definitely and promptly harmful to the human ear.

9. If the transmission of noise is associated with vibrations in solid media, such as floors, walls, etc., the extent of injury and the time of appearance of injury is appreciably increased. If in a noisy workroom, experimental animals are suspended in cages, the ear injury is of a lower order than would be true if the animals were located on the floor of the same workroom, provided the floor is involved in the vibration connected with the noise.

### REVERBERATIONS

10. Noise arising in enclosed or semi-enclosed areas is more damaging than otherwise. This applies to the well known example of boiler-makers' deafness, but conditions attending noise in vehicular or railroad tunnels stand in some relation to this connection. Reverberations may play some part.

11. The plugging of one ear in animals exposed to noises tends to minimize the quantity of noise damage brought about. In some instances of experimental work where animals were suspended, ear plugging prevented any demonstrable injury.

12. When noises of a nearly fixed loudness level affect workmen, the consequent deafness may be limited to an island corresponding to the vibration cycles of the offending cause.

### LENGTH OF EXPOSURE

13. In case of injury due to sustained noise, from one or many sources, the initial injury is probably on a fatigue basis and recovery of hearing depends upon removal from further exposure. Ultimately the damage is on a basis of demonstrable pathologic changes involving the organ of Corti. The location and extent of damage demonstrable in this hearing organ stands in relation to the type of the offending noise cause and the duration of exposure.

14. Occupational deafness is well known among the following classes of workmen: Blacksmiths, machinists, boiler makers, weavers, electrical textile winders, hammersmiths, forgers, aviators, artillerymen, railroad workers, train dispatchers, truck drivers.

These are representative examples rather than exhaustive classifications. In the case of some occupations, hearing deficiency is unilateral, such as among train dispatchers, where customarily one ear phone is utilized.

15. The duration of exposure is most important in relation to occupational deafness. In one study, among those workers exposed only five years, 5.8% were affected, but after 20 years, over 52% of workers were affected. Undoubtedly senile deafness played some part in the latter high figures.

### IRREGULAR NOISES

16. Irregular and unexpected noises are far more distracting in routine work than repetitive noises of the same loudness. Sustained noises from one or multiple sources reduce production on the general order of 7 or 8%. However, soft, pleasing music likewise is disturbing to production, but here there may be introduced an additional factor of "interest."

17. A typical example of the effect of noise in relation to production is found in the following:

In a given factory, experienced workers were engaged in the assembly of a device similar to a thermostat. In a specified unit of time, 80 of these regulators were assembled by the group, but 60 imperfections were found when the work was carried out in an assembly room next to a boiler shop. When this work was transferred to a quiet room, the same group of workers in the same time assembled 110 units with only seven imperfections.

### CHANGES IN BLOOD

18. Noise induces transient changes both in blood and intracranial pressures. It has been observed among patients with open skull operations that sudden noises quadrupled intracranial pressure as measured through the application of drums over the trephine wound connected

## Table 3—Decibel Changes With Intensity Increase

If Sound Intensity Is Multiplied By:	The Change In Decibels Is:
2.....	3.0
3.....	4.8
4.....	6.0
5.....	7.0
6.....	7.8
7.....	8.6
8.....	9.0
10.....	10.0
20.....	13.0
50.....	17.0
100.....	20.0
1,000.....	30.0

with Kymograph recording apparatus, appropriately calibrated.

19. With reference to the digestive tract, it may be shown that salivary flow and peristaltic movements are adversely affected by noise.

20. Many more statements might be made with reference to the effects of noise in producing fatigue, irritability, annoyance, sleeplessness, neuroathenic states, etc.

### NOISE IS WASTE

21. Finally, in this category of excerpted statements, it may be noted that noise is a form of waste energy, which energy may be transposed into better understandable heat units.

In a very rough fashion, it may be maintained that in California's Rose Bowl, at the time of a football game, if a capacity audience, in their enthusiasm, cheered continuously, enough noise energy might be produced to boil all the water that might fill a loving cup to be presented to the winning team.

With reference to the prevention of noise a few sentences may be justified.

a. Preventive measures are of three general types, namely (1) the elimination of noise at its source; (2) the elimination or reduction of noise by altering the surroundings, and (3) personal protection against noise.

b. With reference to the elimination of noise at its source, it may be pointed out that much noise represents waste sound, from automobile horns, loud radios, noisy animals, low flying aircraft, etc. This phase of noise abatement is connected with education and legal procedure.

### NOISE IN INDUSTRY

In industry, noise is chiefly the result of illy devised or improperly installed machinery, worn bearings and other parts, together with improper architecture. The substitution of noiseless procedures for noisy ones is often practical, such as the replacement of the hammer riveter with the pressure riveter, or better still the substitution of welding for all riveting.

Ninety per cent of the noises of industry are susceptible of 50% reduction. The prime key to the industrial noise abatement program is to be found in the demand upon the manufacturer of machinery to produce noiseless or nearly noiseless machines. The modern automobile, properly operated, and during its early years of life, is a fine example of a comparatively noise-free machine. The secondary key in the industrial program is that of machinery maintenance.

c. In the second category, that of reduction of noise by altering the surroundings, opportunities for betterment are to be found in sound absorptive material, walls, ceilings, floors, and the introduction of sound deadening barriers. Radio broadcasting studios in the noisiest of districts are able to eliminate as much as 80% of both interior and exterior noise.

### AIR CONDITIONING

It is here that the connection between noise abatement and air conditioning stands out, for air conditioning means closed doors and windows, thus introducing noise reduction barriers. The effect of such barriers is best seen in aeroplanes, where occupants in closed cabins are subjected to remarkably less noise than a person on the ground, one-quarter of a mile below.

d. Personal protection against noise includes the wearing of "ear defenders," made from wax, impregnated cotton, soft rubber, etc. The wearing of soft-soled shoes is important where floors or ground is an element; the mounting of chairs or other work seats is important in selected operations in order to absorb

vibration effects.

In some very noisy industries, the shortening of the period of exposure may be salutary, and, wherever possible, groups of workers should be located as far away as practical from offending noises, since noise, like light, diminishes inversely as the square of the distance.

Generally it is conceived that genuine injury is widespread as a result of noise action, and that to a greater extent industrial hygiene programs should embrace consideration for noise abatement.

## Howard To Manage Sales For Louisville Airtemp

LOUISVILLE, Ky. — Appointment of E. E. Howard as city sales manager for Home Comfortable, Airtemp distributor here, has been announced by Robert Riddle, general manager.

Mr. Howard has had previous experience in the heating and specialty field, having been assistant general sales manager of Detroit Stove and also with Holland Furnace Co.

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